



August · 1954

safe transit

FROM ASSEMBLY LINE TO FINAL CUSTOMER

KIECKHEFER MILWAUKEE

WATKINS CONTAINERS ARE BETTER

BECAUSE



Producers of economical product protection for "around the corner or across the nation". Service includes Pallets, Kieckhefer Palet-boxes, Industrial Lumber and specially-designed special-purpose containers.

You receive faster service and better quality as all components are manufactured complete on modern equipment in our own plants.

Cleats are permanently attached to the corrugated board with moisture resistant glue—*under pressure of hydraulic equipment* resulting in smooth interiors with no obstructions to damage the fine finished products.

The tube corners are stapled on automatic equipment insuring close evenly spaced stitches and are additionally reinforced with a special cement.

Skid bases are manufactured for strength. The parts are accurately assembled on new modern nailing equipment. All mounting holes are drilled simultaneously on special equipment insuring absolute accuracy.

Whether your current problem is fragile neon signs, industrial equipment or finished products in volume production—check Kieckhefer-Milwaukee for a practical, economical solution.



KIECKHEFER BOX AND LUMBER CO.

* WOODEN BOXES * BOX SHOCKS * CRATES * CLEATED FIBRE SHIPPING CONTAINERS *

1715 WEST CANAL STREET, MILWAUKEE 3, WIS.

safe transit

A monthly trade publication section devoted to improved packaging and shipping and materials handling practices in the home appliance and metal products manufacturing field.

Plant experience information for all executives and plant men interested in the problem of packaging and shipping improvement and loss prevention.

Complete information on the National Safe Transit pre-shipment testing program for packaged finished products, and detailed progress reports of divisions and sub-committees of the National Safe Transit Committee.

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Packaging seminar—was held recently at Packaging Service Co., an NST-certified laboratory in Wyncote, Pennsylvania. It was designed to give representatives of local industries ideas regarding reduction of costs in packing and handling (story on Page ST-12).

Carload strapping methods—have paid off for American Kitchens Division of Avco Mfg. Corp., Connersville, Indiana. Products braced with steel strapping include sinks, counter-tops, and kitchen cabinets packaged in reinforced corrugated fibreboard containers.

PHOTO COURTESY ACME STEEL COMPANY



What happens to your product in transit

a summary of test data compiled by the Technical Planning Division
of the National Safe Transit Committee

FOREWORD

In 1950, the National Safe Transit Committee made available to industry for the first time information showing the magnitude of shocks that PACKAGED PRODUCTS normally encounter from the manufacturer's production line to their ultimate destination. This report, which includes additional data, bears out all the information contained in that earlier report.

It is presented at this time in expanded form in response to the enthusiastic demand of industry and carriers.

Prior to the issuing of our 1950 report, much had been done by many carriers and others to show the shocks occurring in transit by trucks, railroad cars and airplanes. Up until that time, however, there was no accurate data on loading, unloading and other handling conditions encountered by the PACKAGED PRODUCT. The compilation of this data requires special care and attention, since it is necessary to wholly conceal recorders within shipping containers, to obtain data covering a period of several days, and to determine four-directional shocks.

This report covers the complete itinerary of the product — from manufacturer to customer. It reveals many facts that prior to our 1950 report were unrecognized. Brought out, for the first time, was the fact that maximum shocks, regardless of carrier, are those encountered during handling. This includes loading and unloading into carrier's conveyance, switching of trains, trailers and, of course, unloading, warehousing and delivery to the ultimate destination.

Presented here is the summary of the scientific data upon which is based all testing procedures of the National Safe Transit Program.

Technical Planning Division
National Safe Transit Committee

THE Technical Planning Division of the National Safe Transit Committee, working with individual carriers and the major carrier associations — Air Cargo, Inc., American Trucking Associations, Inc., Association of American Railroads, and Railway Express — has compiled a vast amount of data revealing the vibration and shocks encountered by PACKAGED PRODUCTS in transit. The studies, from which this informative data has been obtained, take into consideration the itinerary of the packaged product from the end of the manufacturer's production line to its ultimate destination. Such a journey involves much handling during shipment by one or more of our common carriers.

The research of the NST Technical Planning Division was begun in 1948.

Its purpose was to supplement the existing information which had been obtained by manufacturers and carriers. The results provided a scientific basis for the development of the National Safe Transit testing procedures.

It required many months and thousands of miles of test shipments to secure average conditions encountered. The test shipments were a part of regular out-going shipments involving transit condition handling, both at the origin and destination of the shipment along with that encountered in transit.

Instrumentation

Instrumentation was necessary in order to accurately determine magnitude of shock, time and place of its occurrence.

The shock recorder used in all these tests was a standard instrument which records both vertical and longitudinal shocks. Some of the tests involved two or more recorders mounted in such a manner that shocks in all four directions could be measured. The recorders also made it possible to determine the actual time of day when the shock occurred, thus enabling accurate correlation between the schedules of the air lines, trucks and trains so that it was possible to know at exactly what points the shock took place.

The shock recorders were mounted in wooden boxes prepared as ordinary packaged products so as not to create any unusual attention which might have destroyed the value of the test shipments. In some cases the shock recorders were mounted

direct to the crate base in which the product was being shipped. In other cases a panel of the product was cut away and the recorder bolted to the crate base. In this way all phases of the itinerary from the manufacturer to ultimate destination were covered.

Correlation

This information is not intended in any way to show differences or to be a comparison of carriers or methods of transportation. It does point out, however, that the maximum shocks, regardless of type of carrier employed, are basically of the same

Technical Planning Division

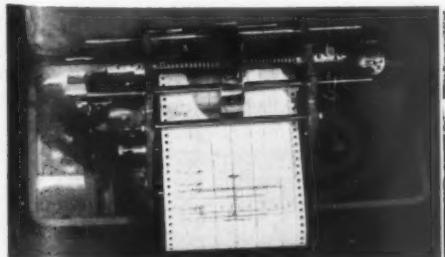
P. W. Bush, Chairman
Westinghouse Electric Corp.
Mansfield, Ohio

F. A. Petersen
Hunter-Thomas, Associates
Cleveland, Ohio

magnitude, and normally occur during handling operations.

Handling, itself, in this regard, may be defined to include freight car switching, train handling, trailer and truck dock-side movements, local delivery by trucks, handling in warehouses, docks, dealers' stores, con-

Photo on right shows a shock recorder, mounted directly on the crate base of a packaged appliance used in a test shipment. Photo below shows a typical shock recorder. The data recorded on the tape makes it possible to determine actual time of day when shock occurred, thus enabling accurate correlation between the schedules of air lines, trains and trucks so that it is possible to know at exactly what points enroute the shock occurred.



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STATEMENT OF POLICY

The National Safe Transit Committee is simply saying to shippers:

"If you will test your packaged products by these test procedures, experience has shown that your loss and damage and your packaging costs will be acceptable minimums. It is up to each shipper to decide whether or not he will use these test procedures. The program is entirely voluntary and implies no connection with tariffs, freight rates, claim procedures or any other existing transit regulations."

NATIONAL SAFE TRANSIT COMMITTEE
1346 Connecticut Ave., N.W., Washington 6, D.C.

tinuing through to the ultimate delivery to the customer.

The procedures as prescribed by the National Safe Transit Committee are based on this data. They are correlated to simulate vibration and shock as encountered during normal handling in transit.

The files of the Technical Planning Division on in-transit shock data are one of the most comprehensive available. This report, first published in 1950,* has been continually kept up-to-date so that modern methods of transportation and their effect on in-transit shocks would be included. Information from these files has been supplied to many government agencies, representatives of the Armed

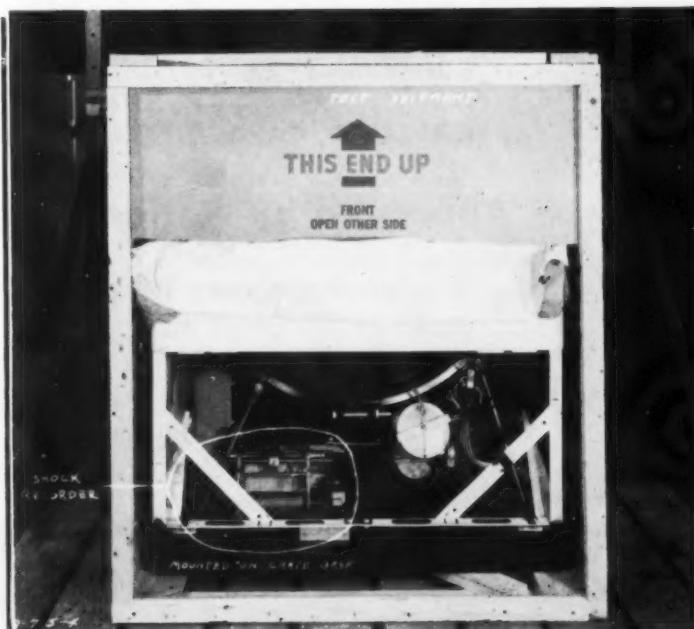
* See October 1950 issue of *finish*.

Forces, many branches of industry, universities, and other interested groups, for use in their work.

Although there was considerable background information and test data available from manufacturers and carriers covering a period of some 15 years, it was found that these tests did not cover all conditions from manufacturer to ultimate destination; also, most of the early information was confined to tests with the railroads. Realizing that it was important to include all methods of shipment by common carriers, test shipments were made by Air Cargo, Railway Express, Railroad Freight, and Truck.

Air cargo

Some 25,000 miles of air cargo



ST-5

DECREASE LOSS CLAIM
INCREASE and YOUR EARNINGS
DAMAGE CLAIMS

EARNINGS

Assure CUSTOMER SATISFACTION thru
 PRE-SHIPMENT TESTING of your packaged products
 on
L.A.B. Package TESTING EQUIPMENT



Why make time consuming test shipments . . . when you can produce the same results in a few hours, . . . while you watch?



**VIBRATION TESTERS
 and
 CONBUR INCLINED PLANE
 IMPACT TESTERS**

FOR LOAD CAPACITIES FROM 600 LBS. TO 10,000 LBS.

• Approved by National Safe Transit Committee

• EXTENSIVELY USED IN MANY U. S. GOVERNMENT LABORATORIES

• AND BY SHIPPERS THRUOUT INDUSTRY

• APPROVED BY CARRIERS



L. A. B. CORPORATION

TEL. SKANEATELES 1161

• SKANEATELES,
 NEW YORK



Bright-Printed Gaylord Boxes Sell Wherever They're Seen

More than just product containers, eye-catching Gaylord *quality* boxes are traveling salesmen, carrying your sales story along the channels of distribution . . . right into consumers' homes.

Our designers can call on a wide range of experience to help you get more advertising value from your boxes. For information and cooperation phone your nearby Gaylord office.

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SALES OFFICES



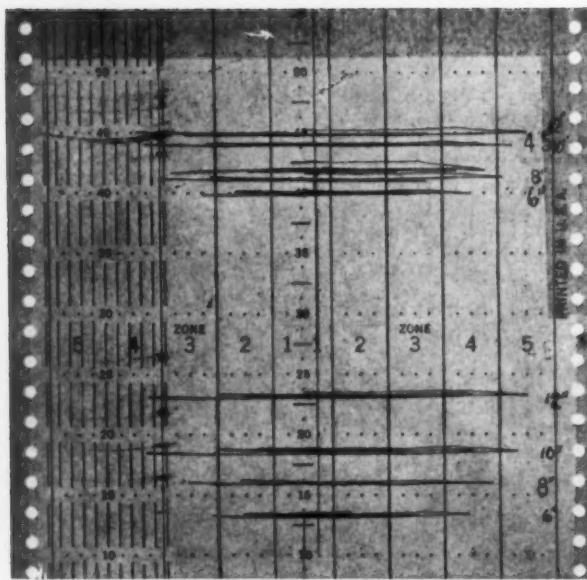
General Offices: SAINT LOUIS, MO.

COAST-TO-COAST

CORRUGATED AND SOLID FIBRE BOXES • FOLDING CARTONS • KRAFT BAGS AND SACKS • KRAFT PAPER AND SPECIALTIES

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ST-7



Handling prior to shipping



Unloading



Subsequent handling to final destination



Handling Shock Measurements — This recording tape shows shocks as received by a Packaged Product when handled on a 2-wheel truck and the leading end of the crate permitted to fall to the floor from different heights (6", 8", 10" & 12" as shown on tape). Drawing at right shows typical handling shocks. The shock recorder was attached to the crate side. The Packaged Product was an automatic dishwasher in a crate 38" high by 29" x 28" base size, with a gross weight of 200 lbs.

tests were conducted, involving air lines from coast to coast and from our southern states to the Canadian border.

Many of our major airlines, working with the Technical Planning Division, cooperated in this program used for tests by Air Cargo.

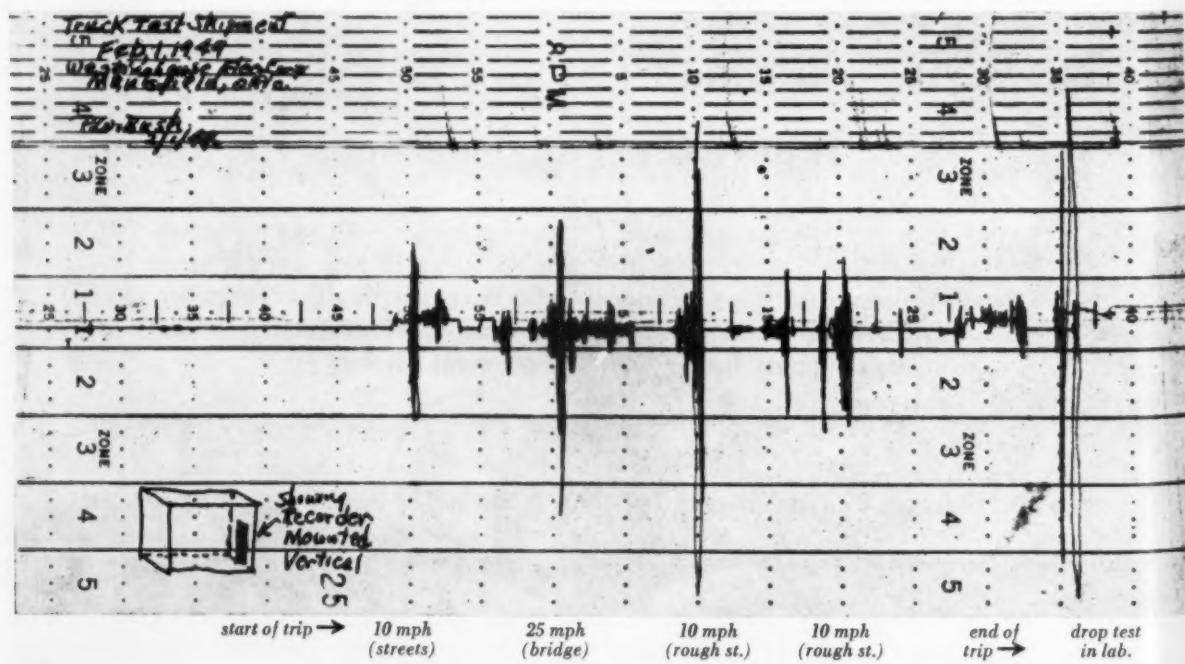
test shipments over specified routes. Top management of cooperating air lines arranged for test shipments in such a manner that they would not attract attention as special cargo.

Shipments were planned so that representative handling was made at all transfer points. (At the Newark,

New Jersey, airport, for example, trucks are used to transport cargo to La Guardia airport, New York.)

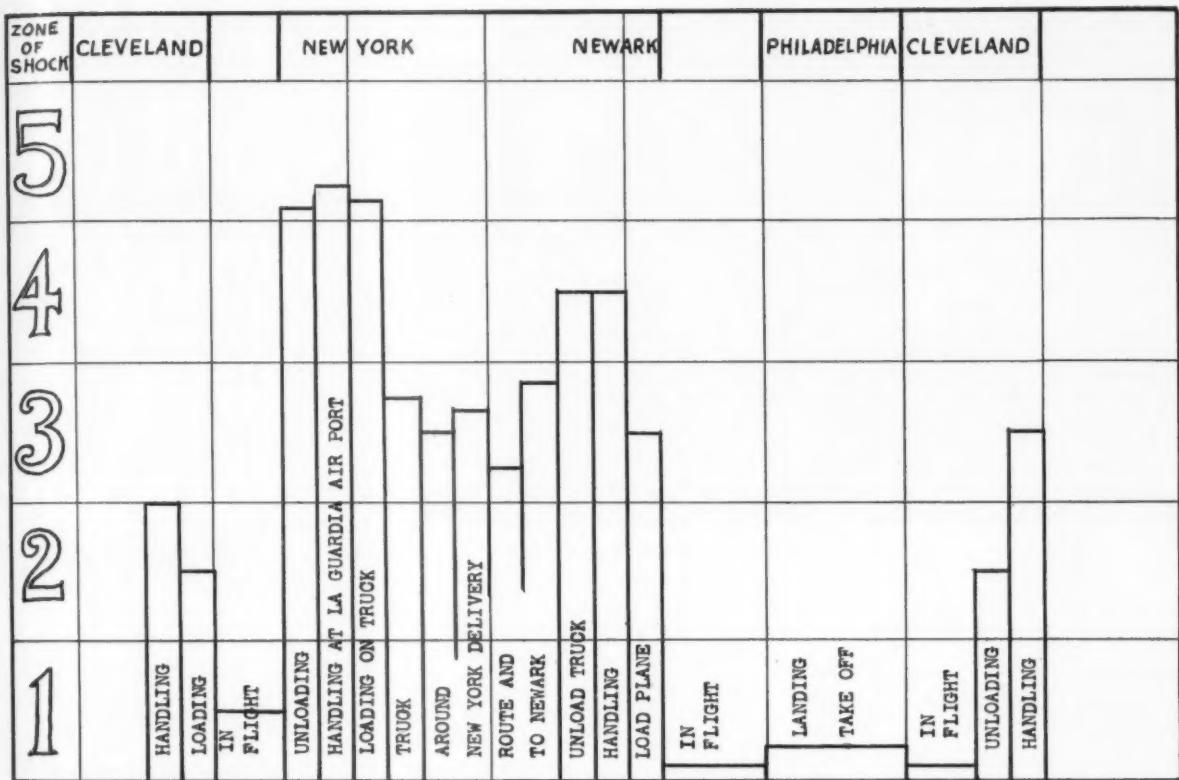
In all cases it was revealed that maximum shock was encountered during handling and not while cargo was in transit. These handling shocks reached well into the 5th zone.

Following shows tape from recorders on a truck test shipment over city streets. The packaged product weighed 80 lbs. (This is shown with the standard 12" laboratory drop test as a comparison at the extreme right on the chart.)



ST-8

AUGUST • 1954 finish



The illustrations on this page show the shocks as received by a Packaged Product shipped as air cargo from Cleveland to New York to Cleveland, including truck transportation from LaGuardia airport to Newark airport.

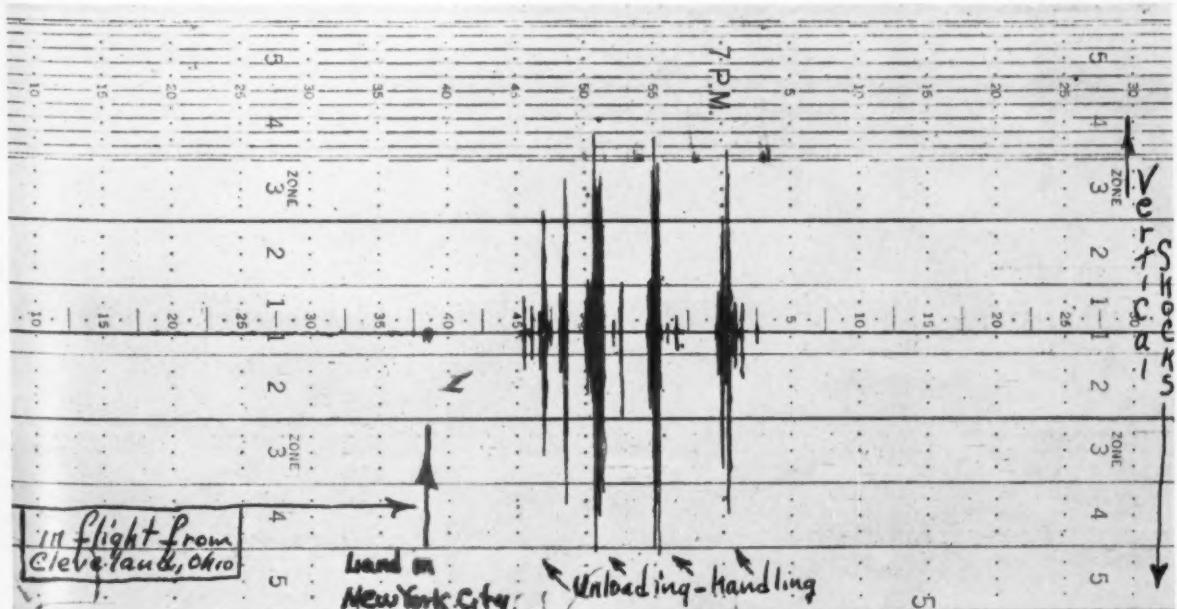
Test shipments by railway

The Railway Express Agency, co-operating with the Technical Planning Division, set up test shipments which would include transfer points,

different railway systems and other conditions which are normal during Railway Express shipments. Shipments were of the same type as those used for tests by Air Cargo.

The maximum shocks encountered in all the test shipments were those during handling, either during the loading or unloading of express cars or at transfer points. Vibration shocks

Shown above is a graphic interpretation of the tape recording shown below. The test Packaged Product was a wooden box, wt. 70 lbs., with two 2-way ride recorders mounted inside, one vertically and one horizontally.





Slow motion photography of a test car during car switching.

in transit were much less severe.

Test shipments by railway freight

Literally hundreds of test shipments were made by railroad freight. The Association of American Railroads and many individual railroads provided facilities and cooperated in securing data.

Shock recorders in many instances were mounted directly on the floor of the freight car or on the crate base of the PACKAGED PRODUCT.

Tests included those in local railroad yards which involved the loading of the freight cars, car switching and other conditions occurring when trains are made up. Shocks were

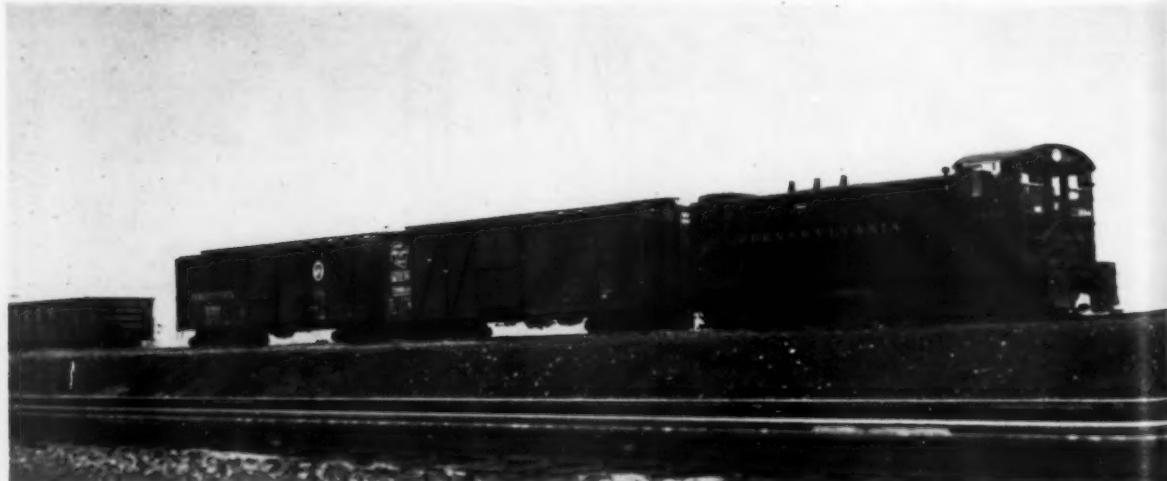
then recorded in transit, at inter-handling points when the car was transferred from one railroad to another, the normal starting and stopping shocks, and others right up to the ultimate destination of the freight car.

Again, it was found that maximum shocks were those from handling the freight car by personnel. Many times during the test shipments these shocks which may be defined as handling vibrational shocks extended well into the 5th zone.

Test shipments by truck

Through the cooperation of the American Trucking Associations, Inc.

Test in this photo involved two cars which were those directly attached to the locomotive. The coal car shown was part of a group of 20 stationary cars in the test to which the test cars were coupled at various speeds.



ST-10

and its members, test shipments were conducted with individual trucking companies and local delivery organizations. They provided representative in-transit conditions over our national and state highways as well as country roads and city streets.

The shock recorders were placed, in most cases, on the crate base of the PACKAGED PRODUCT or on the base of the wooden box used. Some tests were made with the recorders fastened directly to the truck floor. In this way, it was possible to determine the magnitude of shock, and the time and place at which it occurred.

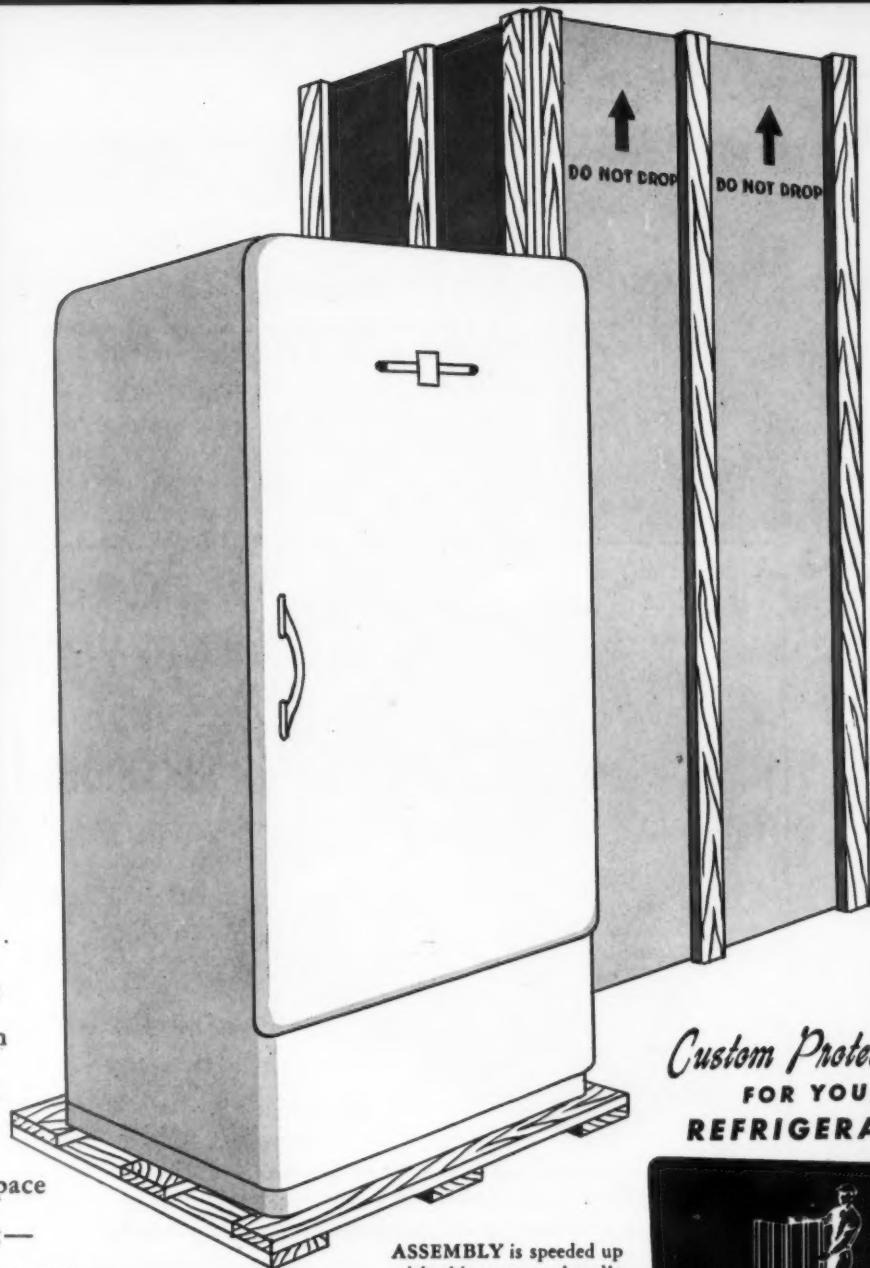
It was revealed that the maximum shocks encountered were those during loading or unloading of the truck, either at the origin or destination of test shipment, or in handling points from one truck line to another. These were recorded well into the 5th zone. Shocks into the 5th zone were also recorded on local delivery systems when the delivery truck passed over rough railroad crossings, rough bridges or encountered bad street conditions, such as a very rough gravel or brick street with washed out holes.

The vibrational shocks, although of higher frequency, were of less magnitude than the vertical impact as described. Transportation by truck enters into practically all the carrier methods at some point, so this infor-

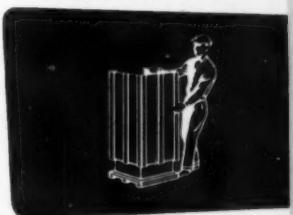
WATKINS has the container for your shipping problem

Watkins Containers provide—stacking strength—ease of assembly—minimum shipping weight, thus reduced shipping costs—smooth staple-free interiors—easy handling—minimum of storage space needed—protection from dust and dirt—resistance to "weaving" and shock—"Traveling board" feature for product identification and advertising.

home appliances, for *all* types of finished products, the Watkins Container is your best insurance for safe delivery. Ship your carefully manufactured products safely and economically—ship them the Watkins Way."



*Custom Protection
FOR YOUR
REFRIGERATOR*



ASSEMBLY is speeded up with this easy-to-handle container. The assembly crews are all for packing the Watkins Way.

these companies build WATKINS containers

Cornell Paperboard Products Co. 1514 E. Thomas Ave., Milwaukee, Wis.
Crazier Container Corp. 446 East 131st Street, Cleveland, Ohio
Crates-Rite Mfg. Corp., Division of Pacific Parts Ind. Inc. 10901 Russell Street, Oakland, California
Dura-Crates, Inc. 940 East Michigan Street, Indianapolis, Indiana
General Box Co. 1825 Miner St., Des Plaines, Illinois, and 16th and Maple Sts., Louisville, Kentucky
Hornb & Martin Mfg. Co. Watsko, Illinois
Illinois Box & Crate Co. 811 Center Street, Plainfield, Illinois

Kleckhefer Box & Lumber Co. 1715 West Canal Street, Milwaukee
Lane Container Corp. 10212 Denton Road, Dallas, Texas
Lewisburg Container Co. 243 Singer Street, Lewisburg, West Virginia
Livingston Wood Manufacturing, Ltd. Tilsonburg, Ontario, Canada
Love Mfg. Inc. 608 South Commerce Street, Wichita, Kansas
Pennsylvania Box & Lumber Co. 2331 N. Bodine St., Philadelphia
Utility Crate Corporation 1985 E. 16th Street, Los Angeles 21, California

—an inquiry to any of these companies will get prompt attention.



The • WATKINS CONTAINER • Manufacturer

mation is pertinent to all methods of transportation. It again points out that the maximum shocks encountered

were those during handling. (This report to be concluded in next issue.)

SAFE TRANSIT LABORATORY SPONSORS PACKAGING SEMINAR

laboratory facilities used to demonstrate pre-shipment testing and improved packaging techniques to local industry

A new type of packaging seminar was held on June 8 and June 15 at Packaging Service Co., an NST-certified package testing laboratory in

Wyncote, Pa. The seminar was an educational session designed to give representatives of local industries ideas regarding reduction of costs in

packaging and handling operations.

This program, conducted jointly by Carl Fleck, laboratory director, and H. Hayes Aikens, sales vice president of Pennsylvania Box & Lumber Co., consisted of a series of demonstrations showing different types of shipping containers designed and developed for the products of a variety of industrial manufacturers.

By using laboratory testing equipment to demonstrate how a newly-designed package would succeed or fail under simulated conditions in transit, it was shown how to develop a satisfactory package which would be neither over-packed nor under-packed. It was pointed out that in only a matter of hours a manufacturer can eliminate the trial and error method of selecting a container which may be costly either in product damage claims, or excessive packaging costs and months of wasted time.

The seminar also covered demonstrations of how faulty product design, resulting in damage claims, can be eliminated. Interior packing materials, bracing, blocking and cushioning techniques were demonstrated. The increasingly important subject of palletization was covered in displays of bulk loading, unusual pallet design and materials handling methods.

Both Pennsylvania Box and Packaging Service are attempting to coordinate industrial packaging and materials programs in such a manner that the best container for safe and efficient product handling can be developed in the least time at lowest possible cost.

THE R-S TWO-WAY RIDE RECORDER

Weight: 17½ pounds
Case Dimensions: 8" x 15" x 8"

**An Important Unit in the "Safe Transit" Program
Used in the Laboratory and in the Field
Accuracy Certified by Independent Testing Laboratories**

THE R-S Two-Way Ride Recorder meets all of the specifications adopted by the National Safe Transit Committee in the standard test procedure. Same sturdy design that has been used so successfully during the past thirty-three years by both railroads and shippers. A simple and reliable instrument.

The following recorders are also available:

1. Savage Impact Register
2. Three-Way Ride Recorder
3. Two Component Accelerometer
4. Three Component Accelerometer
5. Small Accelerometer for Package Testing

All recorders available in following chart drives — in wide variation of chart speeds:

8 day Spring Driven Type	Synchronous Motors 60 cycle Type
16 day Spring Driven Type	Synchronous Motors 400 cycle Type
30 day Spring Driven Type	Impact Actuated Type

Participate in the "Safe Transit" program as many others are doing. Write for more information on how YOU can save money and protect your products in transit.

**THE IMPACT REGISTER CO.
CHAMPAIGN, ILLINOIS**

FEATURE SAFE TRANSIT LABEL IN "PERFECT SHIPPING NEWS"

The June issue of *Perfect Shipping News*, published by the Freight Loss and Damage Prevention Section, Association of American Railroads, featured the National Safe Transit Label on its front cover.

C. A. Naffziger, director, reports that about 29,000 copies of *Perfect Shipping News* are distributed to railroad personnel and about 26,000 copies to shippers, a combined monthly circulation of about 65,000 copies.

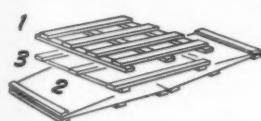
ST-12

AUGUST • 1954 finish

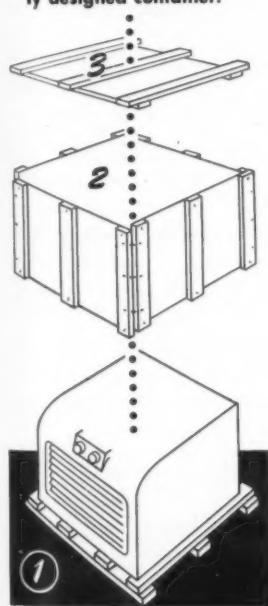


they come flat!

a 3-piece unit.



The view below shows the 3-piece construction of this scientifically designed container.



This Chicago Mill engineered and laboratory-tested container, designed specifically for room air conditioners, is being produced in large volume!

here's the **most practical container** for shipping room air conditioners!

In order to meet the requirements of the growing air conditioning industry, Chicago Mill had its engineers design the best possible container for the protection and shipment of room air conditioners. The hinged corner plywood container that was developed offers these advantages:

- Maximum protection
- Low cost
- Fast assembly
- You can stack them 20 high for compact storage with a good factor of safety

Contact your Chicago Mill representative for complete information.

A shipping container for every shipping purpose

FOR SAFER TRANSIT BY



CHICAGO MILL AND LUMBER COMPANY

33 South Clark Street

Plants at: Helena, Arkansas • Greenville, Mississippi • Rockmart, Georgia
Tallulah, Louisiana • South Fork, Colorado • Chicago, Illinois

Chicago 3, Illinois

SIPMHE TO SPONSOR PALLET STANDARDIZATION PROJECT

At the invitation of the American Standards Association, the Society of Industrial Packaging and Materials Handling Engineers has accepted sponsorship of a project on "Pallet Standardization."

The American Society of Mechanical Engineers has accepted SIPMHE's invitation to administrative co-sponsorship. Scope of the project is

"Standardization of nomenclature, materials, sizes, and components of

pallets, including sampling, inspection and test procedures."

AAR cooperation on "two-way street"

by C. A. Naffziger

DIRECTOR, FREIGHT LOSS & DAMAGE PREVENTION SECTION, ASSOCIATION OF AMERICAN RAILROADS

WE ARE very much interested in the National Safe Transit Program, and are completely in ac-

cord with the principle of the *two-way street*. It is obvious that cooperation between the manufacturers and the railroads has brought about ever-increasing benefits and will continue to do so.

In our work with the Freight Claim Conferences, the various Terminal Committees, the Inspection Bureaus and agencies, Shippers Advisory Boards and other organizations, our special representatives and specialists take advantage of opportunities to tell the Safe Transit story. I am sure you are familiar with our program of quarterly 5-day seminars on the proper preparation of freight for shipment and the safe loading of freight in cars, being conducted for railroad personnel at our Container and Loading Research and Development Laboratory, in Chicago.

We have conducted seven seminars thus far, with the last one held in July. The work of the National Safe Transit Committee is emphasized at appropriate spots during these seminars. You will also be interested in the fact that numerous roads have written to us for information on the NST movement and this we have been very happy to supply.

The railroad representatives made up almost 20% of the total attendance at the industry-wide National Safe Transit Conference in Chicago last year, and no doubt constituted what was probably the largest individual group in attendance. Such representation is definite evidence of railroad interest in the NST movement.

Almost four thousand copies of the talk delivered by Carl Sorby (Roper) at the NST meeting held in March, 1953, were distributed to various railroad personnel, and were well received. Some time ago a poster on the NST label and placard was pro-



IMPACT-O-GRAPH Tells You

When and Where it Happens!

Everybody agrees that shipping damage is a needless waste of money and time.

But in order to stop it — or even reduce it — you must be able to trace the causes.

The IMPACT-O-GRAPH will do just that. It records on tape the time of impact, the direction from which it came and the severity of the shock.

With this information it is possible to fix responsibility and, more importantly, to take steps to correct the causes of damage.

Let IMPACT-O-GRAPH start saving you money. Write today for the whole amazing story!

The IMPACT-O-GRAPH Corporation
1900 Euclid Ave. • Cleveland 15, Ohio

MODELS SHOWN APPROVED BY THE NATIONAL SAFE TRANSIT COMMITTEE

CONTACT YOUR NEAREST IMPACT-O-GRAPH REPRESENTATIVE

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DON W. KELSEY COMPANY
Detroit 35, Michigan • DI 1-3040-12

ROLAND W. LAUTZ, CONVEYORS
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GEORGE PETITT COMPANY
River Forest, Illinois • CO 1-0342

GUY H. RUMPF MACHINERY &
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ROBERT A. SHUEY, JR.
Dallas 5, Texas • LO 2642

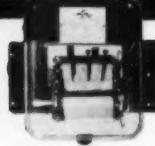
TESTING MACHINES, INC.
New York 23, N.Y. • SU 7-1228

THE THORSON COMPANY
Los Angeles 46, Calif. • HO 3-2311

PROTECTIVE PACKAGING COMPANY
Toronto 12, Ontario, Canada • MA 5969

GOSTA LOTHMAN ENGINEERING COMPANY
Stockholm K, Sweden

Several territories are
available for
representation



MODEL H 3-way package recorder with clocked time element.



MODEL HXS-3-way recorder with ratchet-accumulated tape movement.

There's an IMPACT-O-GRAPH for every need—9 models in all.

duced, and our *Prevention Manual Digest* also carries references to NST. We plan to issue another bulletin highlighting the NST label in the immediate future.

I am certainly in full accord with the National Safe Transit Committee that appropriate measures should be taken to prevent loss and damage before it occurs.

CERTIFICATION FOR WHIRLPOOL DIV., SUTTON, WESTINGHOUSE, SPACARB, CINCINNATI MILLING

The National Safe Transit Committee has announced the certifications of the Clyde Division of Whirlpool Corp., Clyde, Ohio; O. A. Sutton Corp., Wichita, Kansas; Westinghouse Electric Corp., Sharon, Penna.; Spacarb, Inc., Stamford, Conn.; and Cincinnati Milling Products Division, Cincinnati Milling Machine Co., Cincinnati, Ohio.

CERTIFY THREE LABORATORIES

Additional laboratory certifications, announced by the National Safe Transit Committee, include International Paper Co., Los Angeles, Calif.; L. A. B. Corp., Skaneateles, N. Y.; and Indiana Wire Bound Box Co., Indianapolis, Indiana.

MILWAUKEE SIPMHE MEN TOUR NAT'L CONTAINER PLANT

Members of the Milwaukee Chapter of the Society of Industrial Packaging and Materials Handling Engineers were guests of National Container Corp. at a dinner meeting held recently at the company's new plant.

A film, "From the Tree to the Finished Product," depicting National's boxmaking process, was shown to the group. The plant tour was conducted under the guidance of G. A. Farrah, plant manager.

INDUSTRIAL BAG, COVER ASSN. HOLD ANNUAL MEETING

Members of the Industrial Bag and Cover Association, at their 4th annual meeting in Osterville, Mass., June 16-17, elected Stanley G. Yount, Southland Paper Converting Co., president, succeeding H. C. Davis, Bemis Bro. Bag Co.

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Harry M. Hanson, Kennedy Car Liner & Bag Co., Inc., was elected vice president. Philip O. Deitsch was retained as administrative officer.

In addition to Yount and Hanson, the following were elected to the board of directors: A. A. Abramson, Central States Paper & Bag Co., Inc.; A. L. Mills, Propack, Inc.; E. H. Look, Portco Corp.; H. C. Davis, Bemis Bro. Bag Co.; and David M. Weil, Cromwell Paper Company.

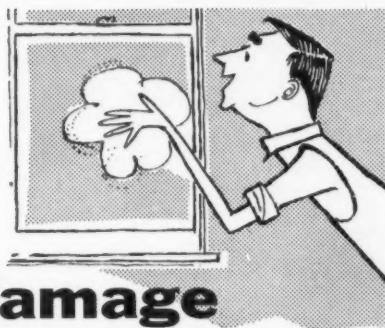
SYRACUSE TRAFFIC CLUB HOLDS "SAFE TRANSIT NIGHT"

Approximately 125 members of the Traffic Club of Syracuse (N.Y.) attended a "Safe Transit Night" meeting which featured NST films depicting pre-shipment testing methods. Guest speakers included R. F. Bisbee, general chairman, National Safe Transit Committee, and P. W. Bush, chairman, NST Technical Planning Division.

**what polishing a
window can teach
you about**

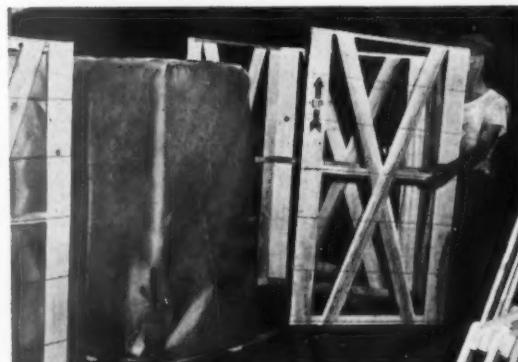
abrasion damage

Ever notice the harder you rub a window, the more dust and lint is attracted to it? Now manufacturers have found the same principle causes abrasion damage in shipping metal and enamel-finished products.



Slight friction due to car movement creates static electricity, attracting dirt, dust and soot to unprotected surfaces. These abrasive particles can ruin a fine finish. Result: lost sales, damage claims.

PREVENT ABRASION DAMAGE WITH CROMWELL *finish-protection* COVERS



- **tailormade**
for your product to seal out dirt, dust and fumes
- **wax-lubricated**
to eliminate friction
- **extra-tough**
to protect against scratch and scuff
- **waterproof**
... stainproof

Specified by leaders in safe transit packaging for appliances, furniture . . . any lacquer, porcelain, wood or plastic finish. Also available in double-thick paper with special non-stain laminate. Ask your Cromwell paper jobber. Or write now for full details.

Paper Engineers for Industry

Cromwell

PAPER COMPANY

4821 South Whipple Street • Chicago 32, Illinois



Range oven windows are packed in both large and small cartons. Here, smaller cartons, each containing 10 windows, are readied for transfer to the shipping area.



Two large cartons, each containing 200 windows, are banded individually to increase the strength of the cartons and jointly to the pallet for safe shipment.

Handling, shipping component parts

(See production story in the July issue)

AT THE new plant of Mills Products, Inc., at Walled Lake, Michigan, completely assembled oven windows for electric and gas ranges are

packed for shipment immediately following final inspection.

The domestic range components are packed either ten to a small car-

ton, or two hundred to a large car-ton. Transfer of the packaged windows to the shipping area is either by combination manual-electric trans-porters or by lift truck.

The cartoned windows are then shipped directly to the range manu-facturers' assembly lines in Mills' own trailer trucks.

Trailer trucks are used to ship the cartoned oven windows directly to the range manufacturers.



CUSTOM DESIGNED

HEAVY-DUTY SHIPPING CONTAINERS FOR

HOTPOINT REFRIGERATORS

HOTPOINT REFRIGERATORS are protected in transit in INTERNATIONAL's specially designed tube and cap shipping containers with these outstanding results.

- Special Interlock-type tube and cap construction permits easier and more efficient lifting holds—without the use of forks or gripping irons. Four are stacked at a time.
- Packing time substantially reduced.
- You need no hammers, pinchbars or nails—minimum of uncrating hazards.
- Dustproof construction.
- Tare weight reduced.
- Smooth, clean surfaces for printing advertising and other data.
- This custom-designed, heavy-duty shipping container is approved by the Freight Classification Committee and is accepted by the railroads as an approved container.

We will gladly tell you how this versatile, sturdy container can be designed to meet your specific needs. Write us at any of our manufacturing plants listed below.




International Paper company
CONTAINER DIVISION

220 East 42nd Street, New York 17, N.Y.

Los Angeles 54, Cal.

Georgetown, S. C.

Kansas City 3, Kan.

St. Louis 11, Mo.

Somerville 45, Mass.

Chicago 38, Ill.

Wooster, Ohio

Whippoor, N. J.

Springhill, La.

Manchester, N. H.

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Customer Service YORK ST. AT PARK AVE., ELMHURST, ILLINOIS
"I saw your ad in finish"

A. O. SMITH TRAFFIC MANAGER

Richard H. Heilman has been appointed general traffic manager for A. O. Smith Corp., Milwaukee, succeeding the late Alfred H. Zastrow.

HAFFA BUYS CAMFIELD MFG.

Titus Haffa, Chicago industrialist, has purchased Camfield Mfg. Co., Grand Haven, Mich., manufacturers of automatic coffeemakers and toasters.

CROSLEY, BENDIX SALES APPTS.

Earl V. Sala, Jr., has been named dryer sales manager of Bendix Home Appliances Division of Avco Mfg. Corp., and H. J. Allen was appointed field sales manager for the Crosley Division. Norman Sabee was named national merchandising manager for both Crosley and Bendix appliances.

APEX TO INTRODUCE WASHER-DRYER COMBINATION

A spokesman for Apex Electrical Mfg. Co., Cleveland, has revealed that his company is planning to start shipping a combination washer-dryer unit to dealers this fall.

CHADWICK BLASTS "PESSIMISM" AT THOR SALES CONFERENCE

Outlining fall promotion plans to district sales representatives, Thomas B. Chadwick, general sales manager, Thor Corp., Chicago, recently blasted the "general pessimism" which he said has crept into the major appliance industry. Thor sales heads gathered in Chicago, June 12-14, to celebrate the successful conclusion of their recent spring contest, and to discuss plans for Thor's half-million dollar fall promotion.

Chadwick states that "There is too much sobbing, too little selling. It is time we faced the fact that the boom is over, that *we are in a sell-or-sink market.*"

He listed three elements he considers necessary to cure the slow appliance market: (1) an outstanding line-leading product — priced for today's market, (2) strong advertising and sales promotion, and (3) salesmen who can and will hit hard.

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Even whirling roller skates won't mar the beauty of PORCELAIN ENAMEL

Years of hard service can't equal a test like this. It shows that *porcelain enamel* stands up to the toughest wear—and still stays bright and beautiful.

If you want to give *your* products extra sales advantages that stand out in comparison with other finishes, make them of Armco Enameling Iron and attach a label bearing the widely-known Armco triangle trademark.

LIFETIME FINISH

The combination of Armco Enameling Iron and fused-on minerals offers a *lifetime* finish. The handsome surface is not affected by time, rust and many other destructive elements. Acid resisting porcelain enamel is not damaged by fruit juices, alcohol or mild household cleansers.

There are no tiny surface pores in Porcelain Enamel to collect dirt and moisture. So stains and dirt are easy to wipe off. Colors never "fade out" even after years of service.

THE "WORLD'S STANDARD"

Armco Enameling Iron—produced for more than 40 years—is known as the "World's Standard." It possesses excellent fabricating properties that are *uniform from one shipment to the next*. Enameling know what to expect. They consistently report a higher percentage of primes and fewer rejects with Armco Enameling Iron.

We'll be glad to send you complete information. Just write us at the address below.



Spinning skates fail to scratch or damage this porcelain enameled kitchen counter top. Underneath the lifetime finish is a special metal base—Armco Enameling Iron.

ARMCO STEEL CORPORATION

4594 CURTIS STREET, MIDDLETOWN, OHIO



SHEFFIELD STEEL • ARMCO DRAINAGE & METAL PRODUCTS, INC. • THE ARMCO INTERNATIONAL CORPORATION

finish SEPTEMBER • 1954

I

LORD HALL LIBRARY

the PERMA-VIEW OVEN DOOR WINDOW

a valuable sales tool for
leading range manufacturers

• Here are the names and trademarks of a few of the leading manufacturers of gas and electric ranges who use PERMA-VIEW "no fog" windows as an added sales tool and as a practical feature for improved baking results.

Each year, more and more manufacturers are turning to "the window you can see through always" to fill the constantly growing demand among homemakers for "visible baking".

If you haven't as yet offered this feature to your merchandising outlets, let us show you how simply and inexpensively this sales tool can be offered — and the sales result you may expect.



MILLS PRODUCTS, INCORPORATED
1015 W. MAPLE ROAD • WALLED LAKE, MICHIGAN



September • 1954

VOL. 11 • NO. 9

finish

MONTHLY TRADE PUBLICATION

Established January 1944

Published by

DANA CHASE PUBLICATIONS

York Street at Park Avenue

Elmhurst, Illinois

Telephone Terrace 4-5280

A trade publication devoted to the interests of the metal products manufacturing industry with special editorial attention to home appliances. Includes technical and practical information on plant facilities and manufacturing problems from raw metal to safe delivery of the finished product, with special emphasis on fabrication, metal preparation, metal finishing, assembly, and packaging and shipping.

Free controlled circulation to management, purchasing, engineering and key plant personnel in metal product manufacturing plants. To others, subscription price is \$5.00 per year, domestic. To all other countries \$8.00 per year (U.S. funds).

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JAMES M. LEAKE

RALPH F. BISBEE

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BPA NBP

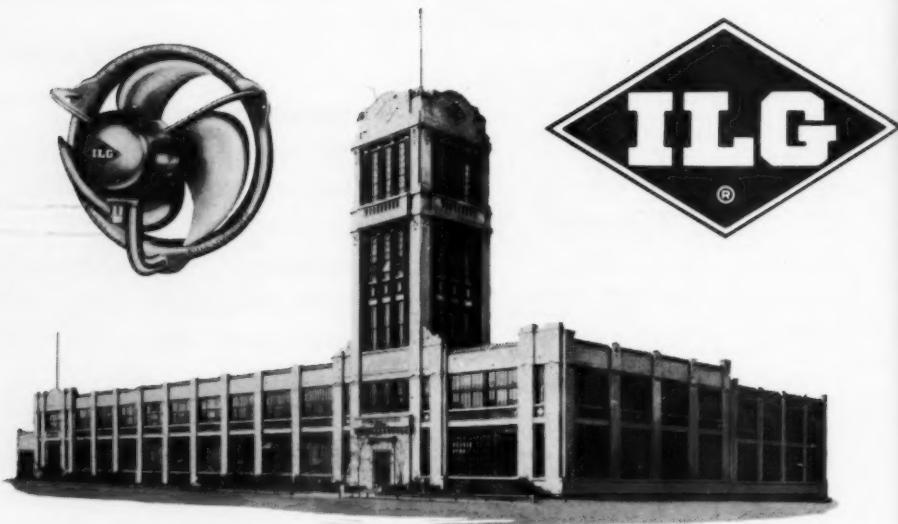
finish

METAL PRODUCTS MANUFACTURING
FROM RAW METAL TO FINISHED PRODUCT

ESSAK METAL CLEANERS

"helped us
lick a production bottleneck"

says W. H. PAULSEN, Plant Superintendent
ILG ELECTRIC VENTILATING CO.



"Recently we had an aggravating bottleneck in our metal cleaning operation that was slowing down our entire production. Naturally we wanted to solve it as quickly, efficiently and economically as possible, so we called ESSAK for assistance. The combination of ESSAK metal cleaners and ESSAK service certainly helped us lick that problem."

The experience of ILG typifies that of plant after plant . . . a metal cleaning problem exists, ESSAK attacks the problem, the problem is solved. It's that simple. If you have a metal cleaning problem and want it solved, just write, wire or phone. We'll be on the job at once. If you want to keep out of trouble and get the most from your metal cleaning operations . . . make your metal cleaning dollars go furthest, don't wait for a problem. Call us now! It will pay you to do so.



ESSAK STEEL & CHEMICAL CO.

4013 MILWAUKEE AVENUE • CHICAGO 41, ILLINOIS

PEnnsacola 6-3400

serving the metal products industry for over 10 years

How to get
your production

"off the ground"



As luggage frames dry after gluing, they are stored and carried to next station. Note how "safety net" protects workers under one of the two 850-ft. Link-Belt assembly conveyors.



Finished luggage is inspected as it moves to the shipping department. Shwayder uses two 700-ft. Link-Belt Overhead Trolley Conveyors for this type of service.

Samsonite luggage is efficiently stored and processed on **LINK-BELT** Overhead Trolley Conveyors

LIKE so many modern factories, Shwayder Bros. found a way to step up production with no extra floor space at their Denver (Colo.) luggage plant. The answer: Link-Belt Overhead Trolley Conveyors.

By putting ceilings to work, you, too, can achieve more efficient production regardless of your plant's physical layout. Link-Belt Overhead Trolley Conveyors travel around obstructions . . . from floor to floor . . . building to building. They remain high in the air

where headroom is required . . . dip floorward to bring the load down to working level.

Equally important, floor space now needed for aisles or storage can be used for machines. Valuable manpower is not wasted to carry, lift or shove.

If your materials move along a fixed route, there's a good chance Link-Belt Overhead Trolley Conveyors can cut your production costs. A conveying expert in the Link-Belt office near you will be glad to analyze your requirements. Why not call him today?

19,302

LINK-BELT
OVERHEAD TROLLEY CONVEYORS

LINK-BELT COMPANY: Executive Offices, 307 N. Michigan Ave., Chicago 1. To Serve Industry There Are Link-Belt Plants and Sales Offices in All Principal Cities. Export Office, New York 7; Canada, Scarborough (Toronto 13); Australia, Marrickville, N.S.W.; South Africa, Springs.



....before Northwest developed Acid Solvent Emulsion Cleaner #1."

Northwest's Acid Solvent Emulsion Cleaner No. 1 completely and quickly removes soil from aluminum parts, preparing the surface for plating, painting, anodizing, zinc chromate priming or other finishes.

**Got a Problem?
Let our Cleaning
Specialists
help you!**



Acid Solvent Emulsion Cleaner No. 1 is fast cleaning, easily rinsed and controlled, readily-emulsified, and economical. It is non-toxic, non-corrosive to equipment, and non-injurious to the metal regardless of immersion time or bath temperature.

Northwest's production-tested chemicals and "Right the first Time" recommendations will save you money. A Northwest Cleaning Specialist with the complete story on Acid Solvent Emulsion Cleaner No. 1 or any of the other great Northwest Chemicals is as close as your phone or write for descriptive literature.

Remember — YOUR COST PER FINISHED ARTICLE IS THE TRUE COST OF YOUR CLEANER





finish SUGGESTION BOX

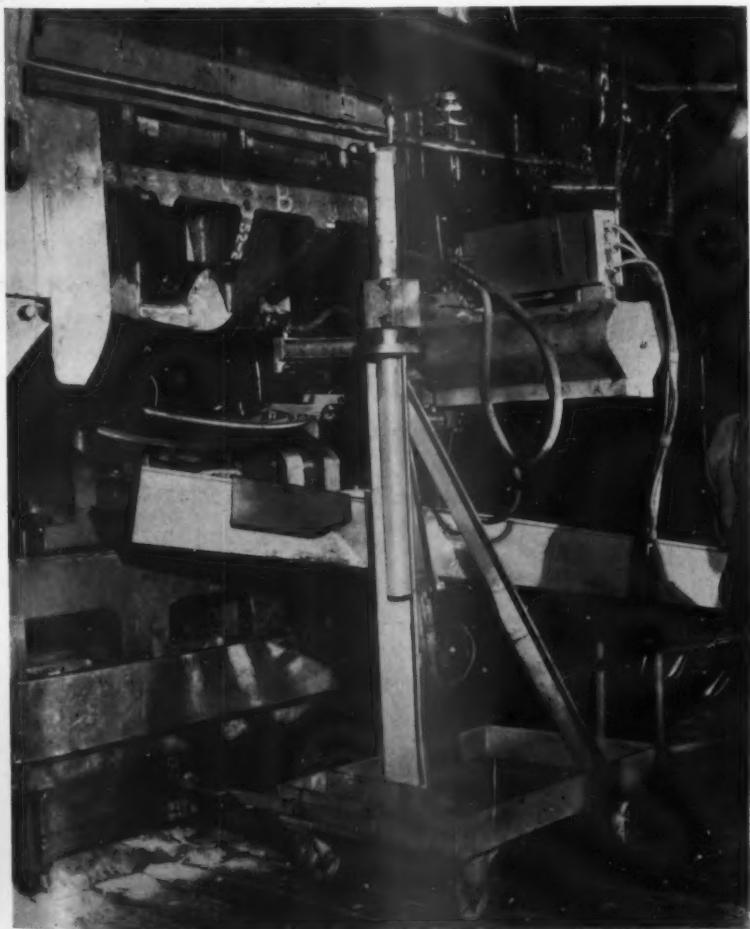
Floor-type unloading machine for metal working equipment

A NEW self-contained floor-type unit has been designed for the automatic unloading of medium size and smaller parts from presses and other metal working machines. The unloader is available with either fixed or roll-away base.

Jaws of the unloading equipment's

iron hands are adjustable in-and-out for different width parts, and up-and-down for different loading heights.

The angle of jaw travel into the die is adjustable, as is the distance which the jaw travels upwards before swinging out. The distance the panel can be swung out from the die is



finish SEPTEMBER • 1954

adjustable up to 8 inches, depending on the length of arm, which is telescoped. It is stated that more than one part can be unloaded at a time, if desired.

Source for more information on this unloading unit may be obtained by writing to finish.

ESTABLISH "PRESTEEL AWARD" FOR METAL STAMPERS

Establishment of the "Presteele Award" — a new annual recognition of the individual or company selected as having made significant contributions to the advancement of the metal stamping industry — was announced by Carter C. Higgins, president and general manager of Worcester Pressed Steel Co., Worcester, Mass.

The company is sponsoring the award in association with the Pressed Metal Institute as part of its 50th anniversary since incorporation — which it celebrates this year.

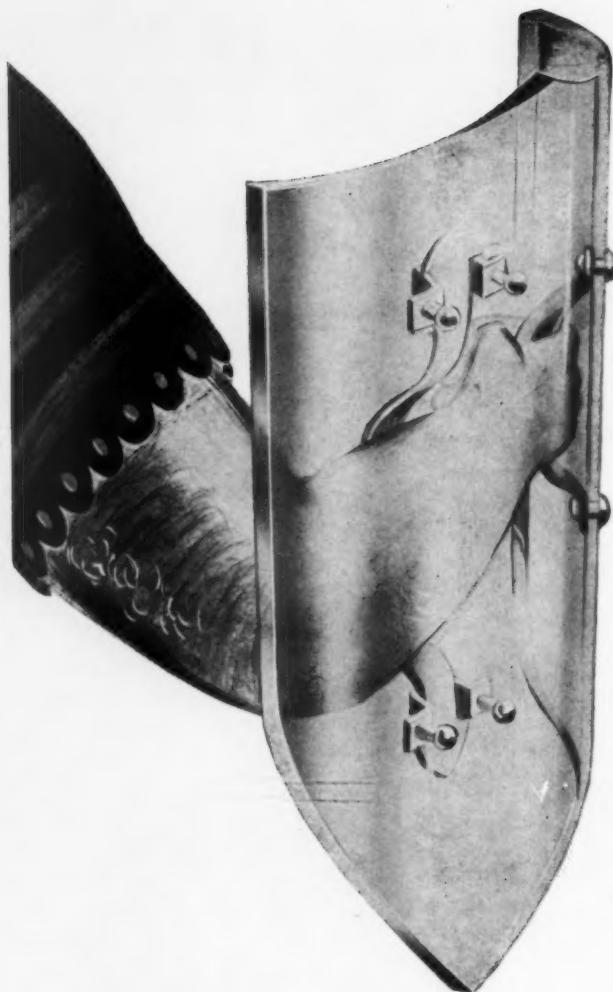
Selections of the award winners will be based on the following criteria, Higgins said: (1) notable advances in developing and marketing products using stampings; (2) contribution in original research, or cost saving, or technical improvements made available to the industry; (3) public education activities; (4) company growth trends, when applicable; (5) participation in formal education, training of new engineers, etc.; and (6) other accomplishments stimulating wider use of stampings.

Outstanding work in any single category may be the deciding factor in the committee's selection — or its decision may be based on important contributions in several of the categories, Higgins explained. • Winners will not be restricted to members of the Pressed Metal Institute, any individual, company, institution or professional group will be considered eligible for judging.

Nominations for the award will be welcomed from all of industry, and should be addressed to the Worcester Pressed Steel Co., 100 Barber Avenue, Worcester, Mass.

LANDERS, FRARY & CLARK PURCHASES DAZEY CORP.

Dazey Corporation, St. Louis, manufacturers of non-electrical products for use in the kitchen, has been sold to Landers, Frary & Clark, New Britain, Conn., for \$1½ million, it was announced by Dazey officials.



this shield, while symbolic,

represents some of the things a master craftsman can do with glass. It can be bowed to fit any desired shape, it can be drilled and shaped to exact tolerances.

It can be tempered to impart extreme resistance to impact — that is why safety regulations demand glass as a safety barrier when danger exists.

*Let Marsco's craftsmen-engineering team
impart to your product all the advantages of glass*



Let glass improve the utility of your product while it beautifies it.

Marsco

MARSCO MFG. CO., 2909 S. HALSTED ST., CHICAGO 8, ILL.



A CASE FOR **UPF*** Bell & Howell Model 253 ...Monterey Projector

A few months ago, Bell & Howell investigated Monarch's *Unified Production Formula*. Today, UPF* provides them with undivided responsibility in the production of their new all-aluminum projector case. Jointly engineered for the most practical die-casting methods—fully machined ... ready for their painting and assembly—multiple handling is eliminated, schedules easily maintained, highest quality standards obtained—all at controlled costs.

***Monarch's Unified Production Formula**
 gives you undivided responsibility from drawing board to finished casting or assembly.
 Better End Products at Lower End Cost

You can quickly know how Monarch's UPF* can profitably serve you. Write today to have your Monarch representative discuss your casting requirements.



DETROIT AVENUE AT WEST 93rd STREET
 CLEVELAND 2, OHIO



ALUMINUM Permanent Mold Castings • ZINC Die Castings • ALUMINUM Die Castings • MACHINING • FINISHING • ASSEMBLY
 finish SEPTEMBER • 1954

Hee's Positive



MILLS PRODUCTS • INCORPORATED

MANUFACTURERS OF PERMA-VIEW

Sealed OVEN DOOR WINDOWS

1015 WEST MAPLE ROAD
WALLED LAKE, MICHIGAN
TELEPHONE MARKET 4-2256

July 16, 1954.

Mr. Dana Chase
FINISH Magazine
360 N. Michigan Ave
Chicago 1, Illinois

Dear Mr. Chase:

This is the fourth consecutive year that we have reported our results from our advertising in FINISH, the magazine which we have used exclusively to take our sales story to the appliance manufacturers.

At the end of three years of consistent advertising we reported that our sales had increased 400% and that a new plant had been built.

We are happy to report that our fourth year of advertising showed another worthwhile gain, both in total business and, even more significant, in the number of important range manufacturers using our PERMA-VIEW oven windows. The gain in business since the year before we started advertising in FINISH has now reached 686%.

In the meantime we have been required to again add to our production facilities to keep pace with sales by building an addition to the new plant we built last year.

As you know, we have some new "irons in the fire" which will enable us to serve a much broader group of your readers. We expect to continue to depend on your publication to take our story to the appliance and metal products manufacturing field. Our program will be stepped up as required to cover new products.

Again we say you may use this letter in any way you wish, as we always recommend your publication to anyone who wants to reach the appliance industry.

Yours very truly,

MILLS PRODUCTS INC.

Herbert E. Mills

Herbert E. Mills

HEM/LB

CLEAR VISION ALWAYS

the Proof... ADVERTISING RESULTS

....the story of
A-VIEW advertising in

86% increase in sales
in 4 years



first PERMA-VIEW ad appeared in July 1950 finish. Mills Products, Inc. has carried a continuous campaign of one black and white page each month for four years except for two months when two color spreads were used.

What were the results of this continuous campaign?

86% increase in number of accounts served, and inquiries from all over the world, within the first year. The second year saw a continued increase in customers at the same rate. Accompanying letter tells the story of a 686% increase in sales — within the span of a four year advertising campaign.

Here is one of the rare instances where advertising results can be definitely measured . . . because . . . Mills Products, Inc. travels no field men, all contacts being made by the principals from the factory . . . and . . . finish is the only advertising medium used for promoting PERMA-VIEW windows.

Here is POSITIVE PROOF that if you have the right material, equipment, component or service for the home appliance and metal products manufacturing field . . . and present it properly in finish . . . the men who engineer and build the metal products plus those who purchase for and manage the producing plants will respond.

NOTE →

Mills Products, Inc. serves only one segment of finish readership — the producers of gas and electric ranges — finish circulation covers the key men of all appliance producers plus a broad group of other metal products manufacturers.

BPA
NBP

only industrial trade publication completely blanketing
home appliance and allied metal products industries

finish

Try Century Vit TITANIUM WHITE



1. COLOR STABILITY
2. HIGH REFLECTANCE
3. HIGH OPACITY

4. GLOSS
5. TEXTURE
6. WORKABILITY

With Century Vit Titanium cover coat over Century Vit ground coat enamel you have an unbeatable combination for adding beauty and durability to your appliance or other metal product.

Century frits are time proved in production plants before they are sold to you. The titanium frits give you the six characteristics: color stability, high reflectance, high opacity, gloss, texture and workability, so important to your plant and finished product.

Then too — you will save money 1) in frit cost and 2) on the production line.

A Century field engineer can show you how to improve your product and save money too if you will let us hear from you now.



CENTURY VITREOUS ENAMEL COMPANY

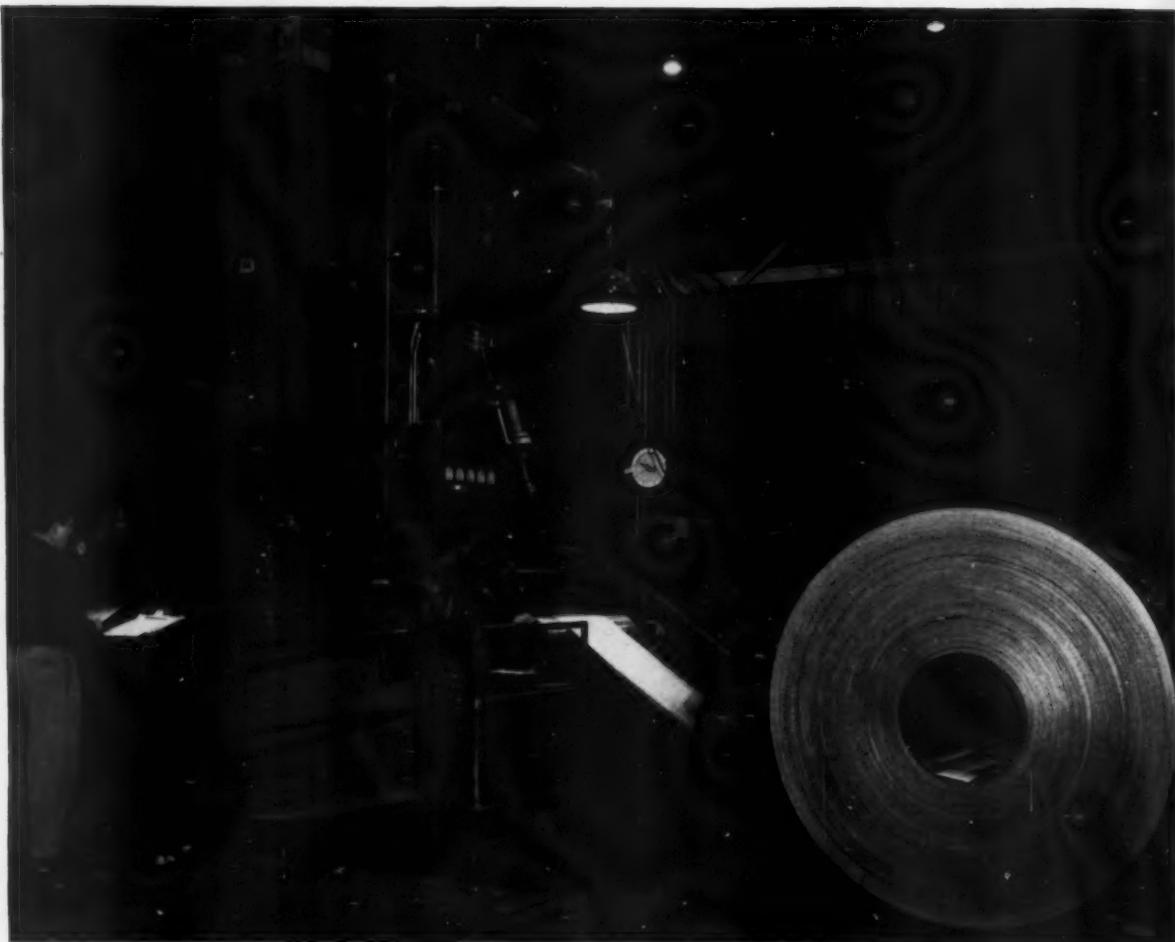
6641-61 S. Narragansett Ave., Chicago 38, Ill.

THE f finish spotlight



Beautiful styling is the key feature in Maytag's new line of gas ranges. Along with the new line of conventional gas ranges have come a complete restyling and the addition of an array of new features. Standard features include stain-resistant porcelain finish, built-in burner bowls, removable burners, table-serve broiler, adjustable leveling pads, serving trays and oven thermostats. Maytag is now offering housewives their choice of five Dutch Oven models or six models with conventional oven.

Let us give you the service you want on cold rolled sheets and strip



In these days of reduced inventories and closer buying, you need quick deliveries. In other words, when you order cold rolled sheets or strip, **YOU WANT SERVICE**.

That suits us. We are set up to give you prompt service from the new mill at our Indiana Harbor Works, East Chicago, Indiana.

Use your telephone to let us know your requirements. Our District Sales Office is geared up to serve you.

Delivery end of new cold reduced sheet mill at our Indiana Harbor Works, East Chicago, Indiana.



Youngstown

THE YOUNGSTOWN SHEET AND TUBE COMPANY

General Offices: Youngstown, Ohio - District Sales Offices in Principal Cities

SHEETS - STRIP - PLATES - STANDARD PIPE - LINE PIPE - OIL COUNTRY TUBULAR GOODS - CONDUIT
AND EMT - MECHANICAL TUBING - COLD FINISHED BARS - HOT ROLLED BARS - BAR SHAPES - WIRE -
HOT ROLLED RODS - COKE TIN PLATE - ELECTROLYTIC TIN PLATE - RAILROAD TRACK SPIKES

Manufacturers of
Carbon, Alloy and Tool Steel

DOW CORNING
CORPORATION

Silicone News

FOR DESIGN ENGINEERS

Modified Silicone Finish Used On Vehicle Heaters For Its Superior Heat And Salt Spray Resistance

Heaters manufactured for use in Ordnance vehicles by the Southwind Division of Stewart-Warner Corporation must withstand temperatures far higher than those involved in civilian applications. In the process of selecting the best finish for these units, the relative heat and corrosion resistance of organic and modified silicone paints were severely tested. The photograph shows the results.



The heater shell at left was sprayed with a modified silicone paint which is formulated by Midland Industrial Finishes, and baked for 30 minutes at 400 F. A similar unit, at right, was sprayed with conventional olive drab (TT-E-485b), and baked for 45 minutes at 250 F. Panels in the foreground illustrate the appearance of both finishes before testing.

Both shells were held at 500 F for 4 hours. The conventional finish was then exposed to salt spray for 100 hours. The modified silicone finish was similarly exposed to a salt spray for 300 hours or three times as long. The organic finish was stained, faded, and badly disintegrated, while the silicone coating remained virtually unchanged. As a result, Stewart-Warner specified the modified silicone finish for all such heaters. *No. 1*

"What's a Silicone?" is the title of a 32-page booklet which answers that often asked question. Indexed and illustrated, this booklet is an interesting and informative description of silicones. *No. 2*

ATLANTA • CHICAGO • CLEVELAND • DALLAS • DETROIT • LOS ANGELES • NEW YORK • WASHINGTON, D. C. (Silver Spring, Md.)
Canada: Dow Corning Silicones Ltd., Toronto; England: Midland Silicones Ltd., London; France: St. Gobain, Paris

finish SEPTEMBER • 1954

Miniature Snap-Switch Sealed with Silastic Has Longer Life and Greater Reliability



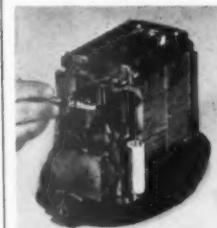
A Silastic® diaphragm has enabled Haydon Switch, Inc., of Waterbury, Connecticut, to produce a hermetically sealed snap-action switch that weighs only about half an ounce and operates with less than half the effort required by standard "aircraft quality" switches.

"Tall Tales and Fabulous Facts" a 24-page booklet in which a parallel is drawn between the tall tales our ancestors told about legendary characters and some equally fabulous facts about Dow Corning silicones.

No. 3

Westinghouse is Always Sure With Silicone Lubricants

For the past six years Westinghouse Electric Corporation has employed Dow Corning silicone fluids and greases to assure lifetime lubrication for their automatic toasters. Besides being used on the latch lever pivot, Dow Corning 41 Grease is also brushed on the guide bars and latch bar, as shown in photograph. A Dow Corning fluid lubricant, 710R, is applied to the pivots and bearings of the toaster timer.



Despite operating temperatures ranging up to 400 F, these silicone lubricants stay in place without oxidizing or hardening. Six years of trouble-free service have convinced Westinghouse that they are ideal lubricants for the job. *No. 4*

The Silastic diaphragm remains so flexible that the operating force on the actuator need not exceed 32 ounces even at -90 F. Fatigue problems and subsequent unreliability associated with metal diaphragms are eliminated. Operational life in the range of a million cycles is far in excess of the best metal diaphragm or bellows.

Accelerated permeability tests indicate that the Silastic diaphragm maintains an effective hermetic seal for more than 10 years. Internal pressures up to 100 psi have failed to produce leakage or rupture, and no change in the diaphragms has been observed even after 72 hours' immersion in salt, fresh or soda water, or in automotive or AN-0-6 aircraft oil.

Originally designed for aircraft, fire control and guided missile service, the new miniature switch is being applied to domestic and commercial washing machines, machine tools and other equipment exposed to liquids or moisture.

That's the kind of performance that has established Silastic as an ideal diaphragm material where pressures must be maintained despite temperatures from -100 to 500 F, weathering and oxidation, or in contact with a variety of oils and chemicals. Silastic is also unique among resilient dielectric materials because it combines high thermal conductivity with excellent resistance to moisture, corona and to fatigue.

No. 5

Design Edition 1

DOW CORNING CORPORATION - Dept. ES-21
Midland, Michigan

Please send me more data on numbers:

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"HOW MEYERCORD
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Here's a way to shave production costs starting in the blueprint stage . . . a complete and continuous service to you and everyone in your organization concerned with product development and merchandising.

Meyercord Nameplate Decals identify your product and instruct consumers in its use. We produce Meyercord Nameplate Decals for *any* commercial surface . . . for *any* temperature condition . . . for *any* production run, short or long. And we take over the design problem.

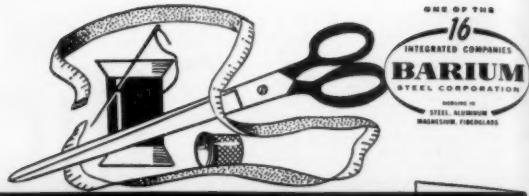
Your Meyercord representative will show how our decals surpass in ease and speed of application . . . with low unit cost. He'll show you how to cut time, labor, and material costs . . . and he'll place our laboratory at your service . . . without obligation.

**FREE! "Mark-It" Manual
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Send today, on your company letterhead, for this valuable full-color guide to every industrial problem in marking, identification, instruction, and information.

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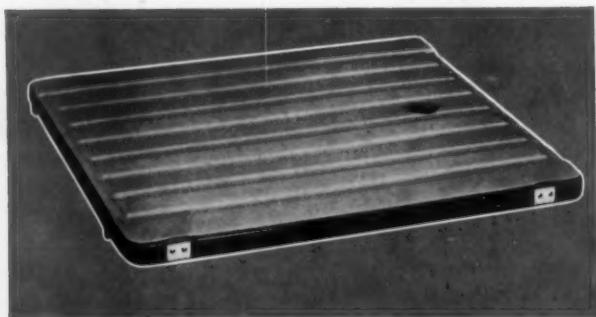
The CUYAHOGA SPRING Co.

SUBSIDIARY OF THE BARIUM STEEL CORP.

10254 BEREAL ROAD * CLEVELAND 2, OHIO

EVERGLOSS

Sliding Drainboard



MODEL No. R-1

INQUIRIES INVITED FROM
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AND DISTRIBUTORS.

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427 PLYMOUTH AVE.
FALL RIVER, MASS.

Additional information on
this ever popular EVERGLOSS
"Sliding Drainboard" will be
sent you upon request.

MEETINGS

STAMPERS ANNUAL MEETING

Pressed Metal Institute, annual meeting, Manoir Richelieu, Murray Bay, Canada, September 4-9.

KITCHEN CABINET MEETING

Steel Kitchen Cabinet Manufacturers Association, quarterly meeting, Hotel Cleveland, Cleveland, Ohio, September 15.

ENAMELERS FORUM, MEETING

Porcelain Enamel Institute, annual Shop Practice Forum, University of Illinois, Urbana, September 8-10.

Porcelain Enamel Institute, annual meeting, The Greenbrier, White Sulphur Springs, W. Va., Sept. 29-Oct. 1.

PACKAGING, HANDLING SHOW

Society of Industrial Packaging and Materials Handling Engineers, annual National Industrial Packaging and Materials Handling Exposition, Short Course, and Packaging Competition, the Coliseum, Chicago, September 28-30.

VENDING MACHINE SHOW

National Automatic Merchandising Association, convention and exhibit, Hotel Statler, Washington, D. C., October 10-13.

GAS ASSOCIATION CONVENTION

American Gas Association, annual convention, Atlantic City, October 11-14.

NATIONAL METAL SHOW

National Metal Exposition and Congress, International Amphitheatre, Chicago, November 1-5.

HOME LAUNDRY CONFERENCE

American Home Laundry Manufacturers Association, annual Home Laundry Conference, Hotel Commodore, New York City, November 4-5.

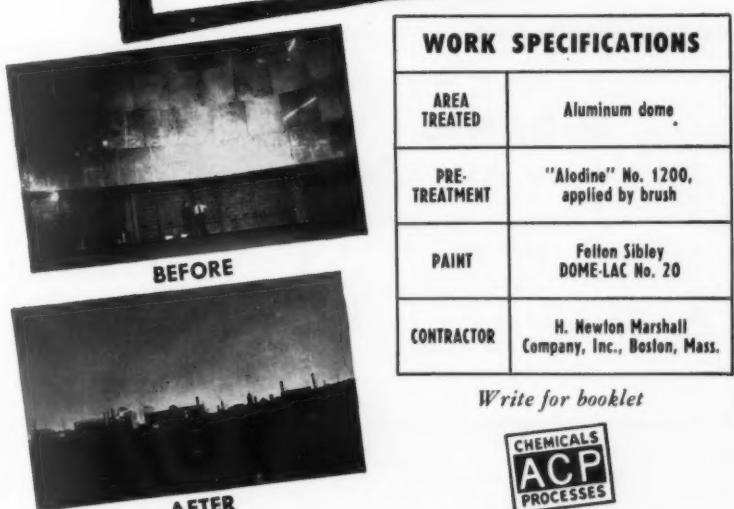
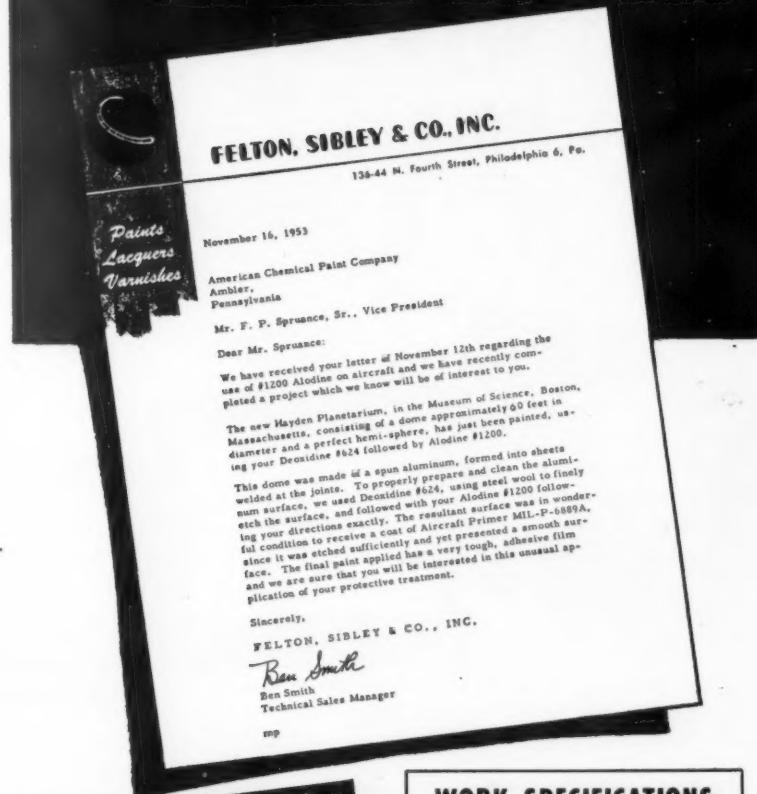
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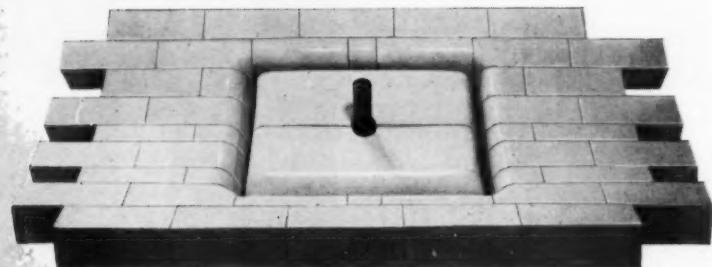
Detroit, Michigan

Niles, California

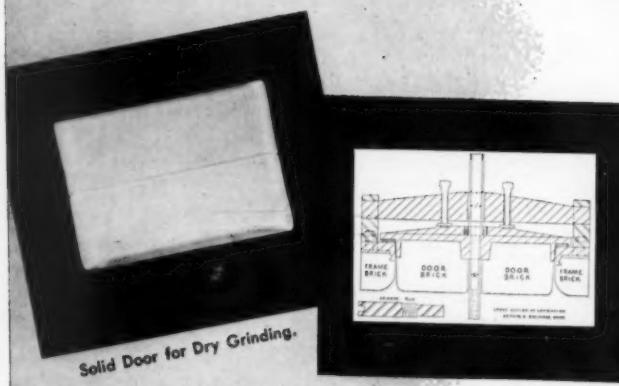
Windsor, Ontario

McDANEL

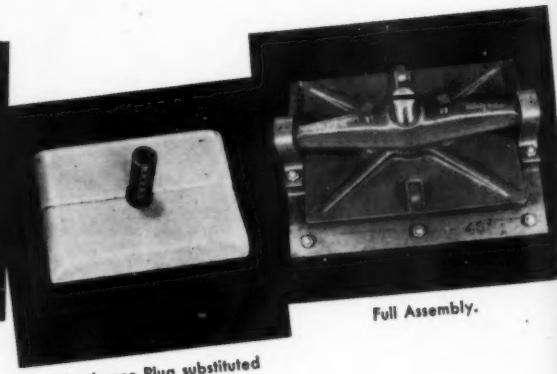
MILL HEAD ASSEMBLY



Inside View of door in Place.



Cross Section View.



Full Assembly.

Discharge Plug substituted
for Grinding Plug.

CHANGE TO McDANEL Mill Head Assembly

Your old doors can be replaced easily and quickly with the modern McDanel Mill Head Assembly.

Replaces old frame, door, gaskets, bolts, clamps — everything for a complete installation.

McDanel High Density Door Blocks and Frame Bricks are harder and tougher than standard Porcelain. They can be depended upon to give perfect protection around the door where the mill lining is subject to greatest wear and abuse.

Other features include protection against grinding iron off the door and mill frames, the discharge of wet grinds without removing the door, and long, trouble-free life.

McDANEL
Industrial
PORCELAINS

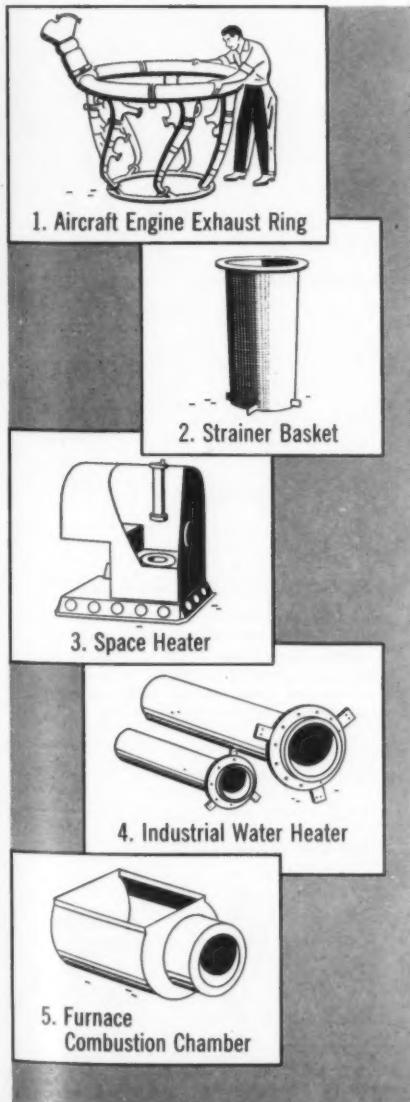
McDANEL REFRactory PORCELAIN CO.
BEAVER FALLS, PENNA.

*Use lightweight,
corrosion-resisting*

PORCELAIN ENAMEL

to combat

HIGH TEMPERATURES



Temperatures of 1700° F and even higher are within the working range of recently-developed Porcelain Enamels and Ceramic Coatings. Coupled with excellent corrosion resistance, the ability to withstand high temperatures makes Porcelain Enamel an exceedingly valuable finish for a wide variety of applications. In many high-temperature applications, Porcelain Enamel's resistance to thermal shock, and its exceptionally high emissivity value are very important advantages.

Porcelain Enamel is formed by fusing a glass-like coating to a metal base when it is above the "red-hot" temperature. This inseparably bonds the coating to the metal. Therefore Porcelain Enamel combines the strength of the metal and the hard, non-porous, impervious characteristics of glass. Being entirely inorganic, it is appropriately called "The Lifetime Finish."

Parts are readily produced in a wide variety of sizes and shapes. Base metals include many carbon and alloy steels, cast iron and non-ferrous metals. Fabrication of the metal is by customary methods. The enameling may be done by firms who specialize in this work.

Use the coupon below to get information that will help you design with this modern engineering material.

PORCELAIN ENAMEL INSTITUTE, INC.

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PORCELAIN ENAMEL INSTITUTE,
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Will you please send me your latest design information on Porcelain Enamel. I am interested in this material for:

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Company _____
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ANNOUNCING...

a new **LOW COST** water wash spray booth

—by **Binks**

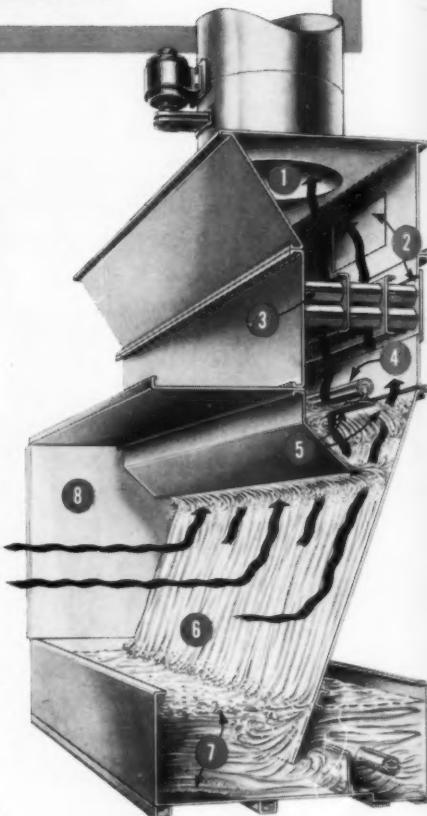


Ideal for use in most plants

This new low-cost Style D water wash spray booth is recommended for normal industrial production. It supplements the Style DUC booth which is unequalled for heavy production and hard-to-handle paints. But the powerful double washing action of this new booth makes it ideal and fully approved for the big majority of spray painting installations.

✓Check these 9 money-saving features:

- 1 **Fan stays cleaner longer.** Virtually all pigment is removed from exhaust air.
- 2 **Easy access.** Fan and arrestor plates are reached through doors in back of booth. When booth is installed against a wall, access doors are placed in front and lower section of water curtain is easily removed.
- 3 **No moisture reaches stacks.** Arrestors trap moisture.
- 4 **Unbroken water curtain.** Binks special clog-proof Dynaprecipitator manifold distributes water uniformly.
- 5 **Double washing.** Paint fumes and overspray must pass through 2 washings before they leave the booth.
- 6 **Stays clean longer.** The water curtain is constantly flushed.
- 7 **Overspray reclaimed.** Overspray is washed into the water pan where it is trapped for easy removal or reclamation. This minimizes paint sludge reaching the circulating pump.
- 8 **Rigid, long-life construction.** Engineered to give long, trouble-free service.
- 9 **Economical.** Costs less, uses less electricity, occupies less floor space, requires less maintenance.



LET US ANALYZE YOUR NEEDS

Without obligation a Binks engineer will gladly call at your office to discuss the advantages of this new booth or to help you with spray painting problems of any kind. Just contact your nearest Binks office or write directly to the address below.

ASK ABOUT OUR SCHOOL. A week of training in best finishing methods, equipment selection and maintenance. No charge for tuition. All welcome. Write for class dates and curriculum.

BINKS MANUFACTURING COMPANY 3122-40 Carroll Ave., Chicago 12, Ill.



GUNS • COMPRESSORS • FLUID TANKS • EXTRACTORS • ACCESSORIES

REPRESENTATIVES IN PRINCIPAL U.S. & CANADIAN CITIES • SEE YOUR CLASSIFIED DIRECTORY



gas appliance coverage

Gentlemen:

I have looked through my copy of the July issue of *finish* which contained the review of our annual Gas Appliance Manufacturers meeting.

While none of the Divisions of Rockwell Manufacturing Company produce home appliances, I am personally much interested in the gas appliance industry as collateral to our interest in the gas industry generally.

Your periodical certainly assists the gas appliance manufacturer to learn new methods and materials with which to continually improve the appearance of his products and generally upgrade and modernize gas appliances.

W. F. Rockwell, Jr.
President
Rockwell Manufacturing Company
Pittsburgh, Penna.

Mr. Rockwell is the new first vice president of the Gas Appliance Manufacturers Association.—Eds.

appliance technical conference

Gentlemen:

You have done a wonderful job in writing up the Appliance Technical Conference (July *finish*). Mr. Heuertz should also be complimented in the way he handled his assignment with the least possible disturbance to the Conference.

R. W. Fauquet
Division Manager
Merchandise Testing and
Development Laboratories
Sears, Roebuck & Co.
Chicago, Illinois

Mr. Fauquet was chairman of the Appliance Technical Conference Committee. — Eds.

how fast time flies

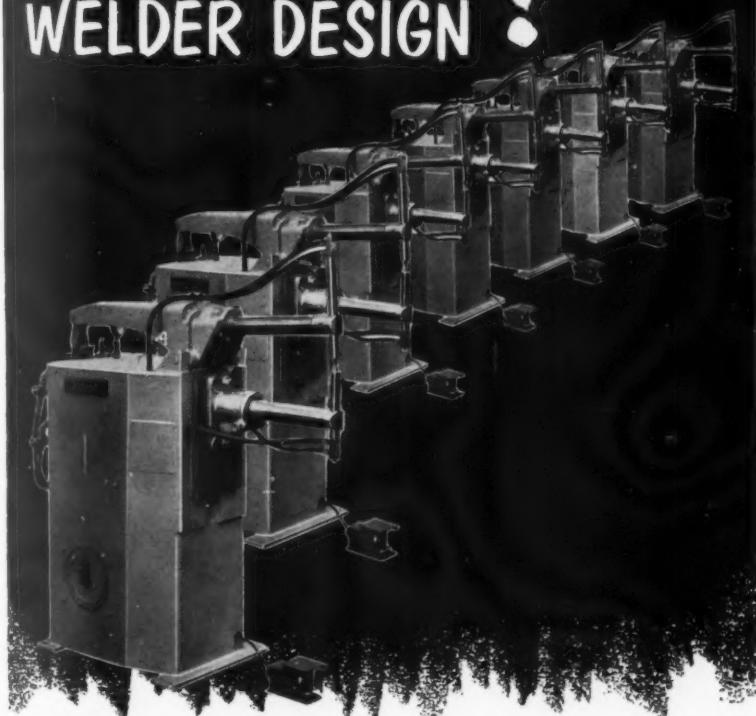
Dear Mr. Chase:

Heartiest congratulations and best wishes to you and the whole outfit on your move to Elmhurst.

The older we get, the faster time flies. It seems only yesterday that you and I had the same job in competitive companies. You've come a long way since then, and you've deserved every

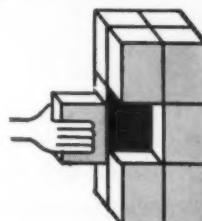
to Page 23 →

WHAT'S NEW IN WELDER DESIGN?



UNITIZED CONSTRUCTION, IMPROVED DESIGN of Federal's Rocker-Arm Spot Welder MEANS BETTER WELDS, FASTER, LOWER UPKEEP

UNITIZED DESIGN A Federal Exclusive!



Component parts of each system are sectionized and mounted on individual, removable panels. Normal "down-time" is reduced to an absolute minimum; maintenance greatly simplified.

Federal's New Rocker Arm Spot Welders—redesigned from base to tip—to deliver highest production with a minimum of operating and maintenance costs. Feature for feature they are the outstanding low cost spot welders of this type available today.

Here's a few of the many features: **Unitized Design**, built in sections for easy maintenance and interchangeability; **More Space**, tapered frame permits greater working areas; **Compact Construction**, trims bulk—all lines are outside frame—easily accessible without unsightly and dangerous protrusions; **Ferrule Fittings**, with threaded couplings, permit quick, simple disconnect of all water and air connections; **Low Loss Cylinder** of new design boosts efficiency as does the new style **Low Inertia**, streamlined Horn Raising Lever. It's all new! It's welding efficiency at its finest. It's another reason why welding engineers trust "Federal—First in Resistance Welding."

THE FEDERAL MACHINE AND WELDER COMPANY

WARREN, OHIO





**When things are going all wrong,
your little Vice President at home
is quite upset . . .**

**But, when everything is running
smoothly at home, your little
"Veep" is very happy.**



THE SAME IS TRUE AT THE PLANT, but you can keep things running smoothly by specifying Ing-Rich frits for your production line and everybody will be happy.

Old man practical experience is the answer. Remember, not only do we produce frits . . . but . . . we use those frits in the enameling of our own products and in our large job enameling plant.

You will indeed be happier when you take advantage of the "know how" that comes to you in Plant-Tested Ing-Rich Frits.

INGRAM-RICHARDSON, INC.

OFFICES, LABORATORY AND PLANT, FRANKFORT, INDIANA



From the Editor's mail

→ from Page 21

bit of the success you've had in building up a magazine from scratch to a position of preeminence in its field. I know less than nothing about the work that was entailed, but I do know a good job when I see one.

C. P. Lohman
Sales Manager
Pemco Corporation
Baltimore, Maryland

report from Hongkong

Gentlemen:

You will be interested in the enclosed letter we received from Hongkong, which shows that *finish* is read around the world. You may keep the letter as we have made a copy of it, and have already answered it.

John M. Tuthill
Ass't General Manager of Sales
The Youngstown Sheet & Tube Co.
Chicago, Illinois

well received on West Coast

Dear Mr. Chase:

I will say that *finish* is being well received by all people that I have talked with. The librarian of the Pacific Coast Aeronautical Library tells me that it is in very heavy demand among the readers. Of course, we have carried some very pertinent aircraft production articles.

At Rheem, *finish*, along with *Machinery* and the *Post*, are the three magazines kept up-to-date and available at all times. Karl Pfeander, Rheem's plant engineer, said he thought *finish* was one of the best technical magazines published.

Gilbert C. Close
Western Editor
Hawthorne, Calif.

appliance engineering

Gentlemen:

Thanks for the extra copy of the July issue of *finish*. I wish to congratulate you on its high quality and to remark that but for it an important phase of the industry would be almost completely neglected by the technical press.

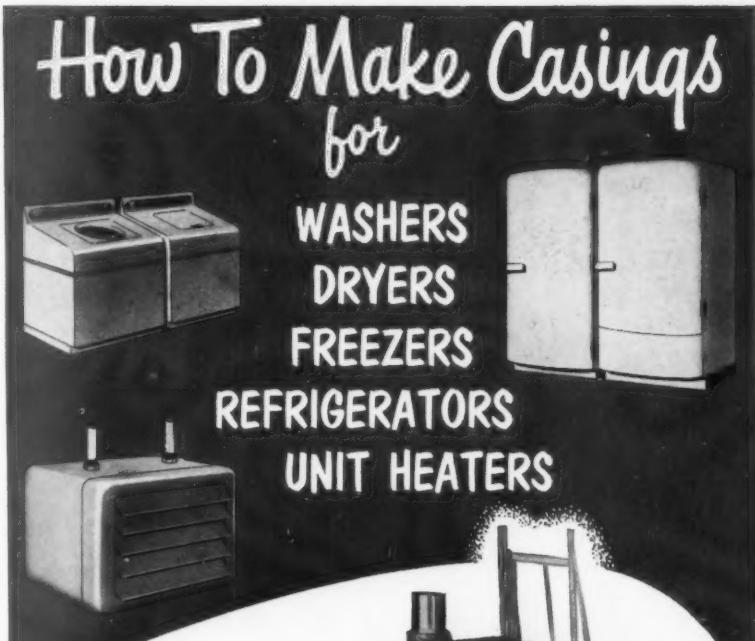
Frank Kahn
Senior Technical Assistant
Testing Division
Philadelphia Electric Co.
Philadelphia, Pennsylvania

Mr. Kahn was a member of the "components panel" at the recent Appliance Technical Conference which was covered in the July issue of *finish*.—Eds.

finish SEPTEMBER • 1954

How To Make Casings

for



**WASHERS
DRYERS
FREEZERS
REFRIGERATORS
UNIT HEATERS**



**BATH OPEN THROAT
SINGLE WING SEQUENCE
PRESS IS IDEAL FOR
PRODUCING DOMESTIC
APPLIANCE CASINGS AND
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THE BATH SINGLE WING TANGENT BENDING SEQUENCE PRESS is the recognized machine for forming cases and cabinets for the electrical appliance industry.

The **OPEN THROAT** permits faster feeding, easier removal of finished work. **CORNER RADII** require no refinishing. **QUICK DIE CHANGE-OVERS** reduce down-time to a negligible minimum. **BENDS** are clean, finish unmarred and flanges smooth and wrinkle free.

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IF YOU USE SET-UP WHEELS . . .

here are facts to prove you can save from \$301 to \$2184 each year at each set-up wheel station.

First, let's examine the upkeep costs of set-up wheels (rag wheels). In a survey just completed, set-up wheel users reported the cost of recoating these wheels to be from 12c to 32c each. These figures were for labor and material only. The survey also showed that one operator uses from 6 to 40 wheels every day.

Thus, taking an average recoating figure of 22c — a conservative figure of one operator using 10 wheels a day — and a 250-day production year . . . the yearly upkeep cost of set-up wheels for one operator amounts to \$550.

To this cost must be added the replacement cost of worn out wheels. The survey showed that one operator will wear out a minimum of 60 set-up wheels in one year. At a replacement cost of \$3, this adds another \$180 to the total.

The total is now \$730 — the cost per operator per year using set-up wheels.

There is another answer. Numerous on-the-job tests have proved that Nu-Matic Aircore Air-Inflated Grinding Wheels will handle the same production work assigned to set-up wheels — and will produce results that are somewhat superior.

How do Nu-Matic Wheels compare with set-up wheels on costs? When a Nu-Matic Grinder is used, the upkeep costs stem from the replacement of worn coated abrasive bands. A recent cost study made by one of the largest appliance manufacturers shows that they get three times more work finished with one abrasive band on a Nu-Matic Grinder as they used to from a similarly sized set-up wheel.

Thus, if an operation requires 10 set-up wheels a day, the same job will wear out approximately 3½ abrasive bands each day — a total of 750 bands in one year. Figuring 60-grit glue bonded abrasive bands for a 5" x 2½" Nu-Matic Grinder, band cost varies between 17.3c and 24c depending on quantity purchased. Using an inbetween price of 21c, the yearly bill for abrasives would amount to \$157.50.

There is one replacement item on a Nu-Matic Grinder — the contact drum. Two drums a month per operator is a high figure. This adds another \$96 to the yearly upkeep costs. Adding these figures together we get a total of \$253.50 — the upkeep cost per operator per year when a Nu-Matic Grinder is used.

What's the payoff? A yearly saving of \$476.50 for each operator. One of our customers has 150 set-up wheel operators. We can save him \$71,475.00 each year in direct costs alone. This represents a potential increase in net profits before taxes. Add to this the savings realized by the elimination of the overhead necessary to operate a set-up wheel recoating department.

If your direct cost for recoating each set-up wheel is greater than 15c (we have assumed 22c), then a searching examination of your set-up wheel operation is in order. Begin that examination with a set-up wheel vs. Nu-Matic Grinder cost comparison AT OUR EXPENSE. We will ship you a Nu-Matic Aircore Air-Inflated Grinder for a 25-day free trial period. Just send us a letter outlining the job requirements and the size set-up wheels you are using now. We'll do the rest.

Here's a tabulation of the above figures:

COMPARATIVE COSTS — SET-UP WHEELS VS. NU-MATIC GRINDERS
1 operator for 1 year = 250 working days

Set-Up Wheels

Recoating wheels (10 a day) 2500 @ 22c	\$550.00
Replacing worn out wheels 60 @ \$3	180.00
	<u>\$730.00</u>

Nu-Matic Grinders

Abrasive bands (3 a day) 750 @ 21c	\$157.50
Replacing contact drums (2 a month) 24 @ \$4	96.00
	<u>\$253.50</u>

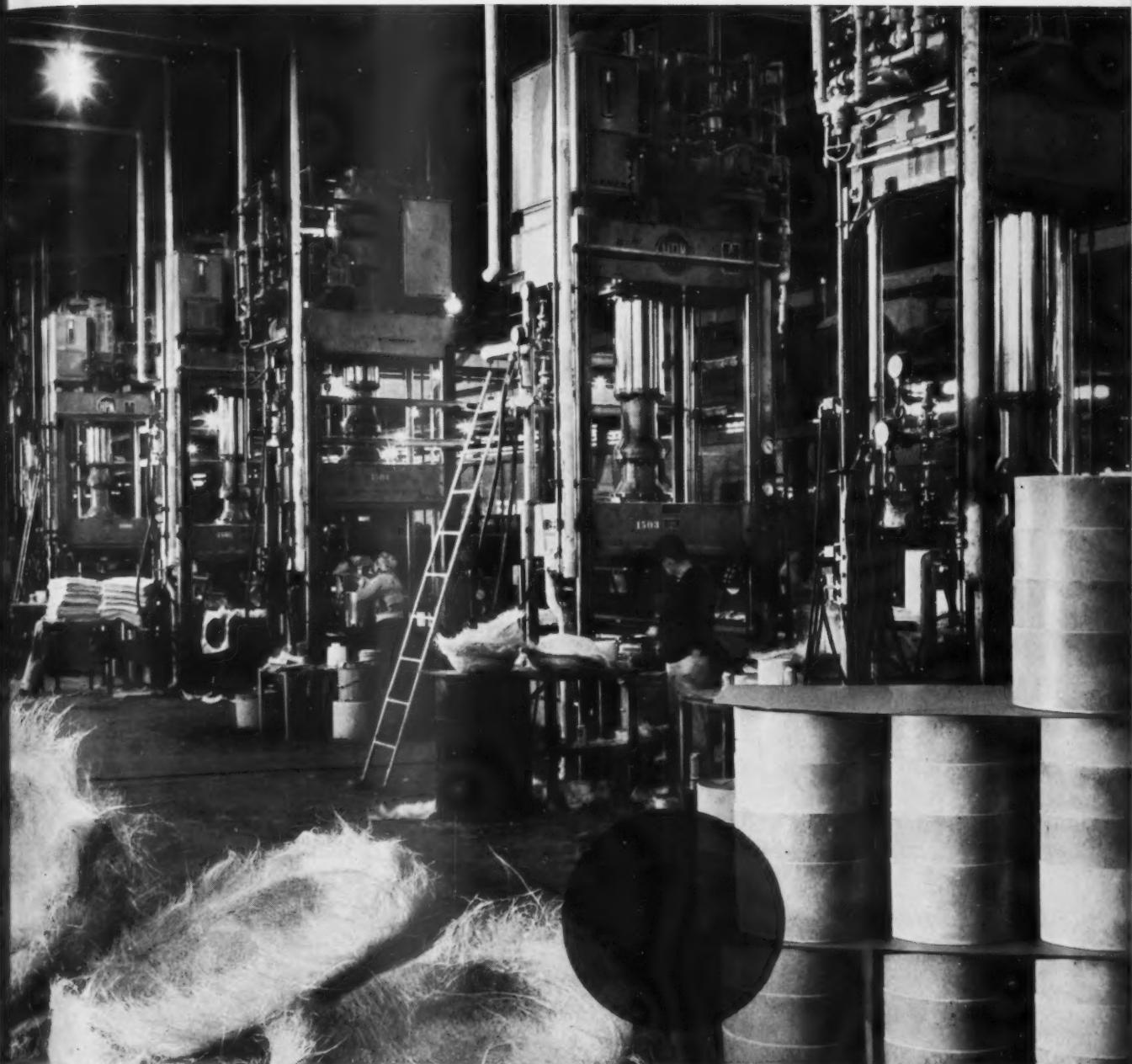
SAVINGS (each operator — each year) \$476.50

As mentioned, the figures used in the above analysis are conservative. Actual savings will vary with YOUR recoating costs and the number of wheels YOU use each day. Here's a chart that shows possible savings when Nu-Matic Grinders are used instead of set-up wheels.

If daily number of set-up wheels used by one operator is:		If recoating cost per set-up wheel is:			These will be the yearly savings per operator using Nu-Matic Grinders.
		10	20	30	
15c	\$301	\$464	\$684		
20c	426	714	1059		
25c	551	964	1434		
30c	676	1214	1809		
35c	801	1464	2184		

Nu-Matic Grinders, Inc.

8224-A Carnegie Ave. Cleveland 3, Ohio



need strength in your product? use plastics molded by General American

What kind of a strength would you like in your product? *Shock resistance*, like a survivors' kit that withstands parachute drops in rough terrain? *Structural strength*, like a TV cabinet? *Stamina*, for working parts, like a washing machine agitator? *All-weather toughness*, like a street light globe? General American has molded all these and more.

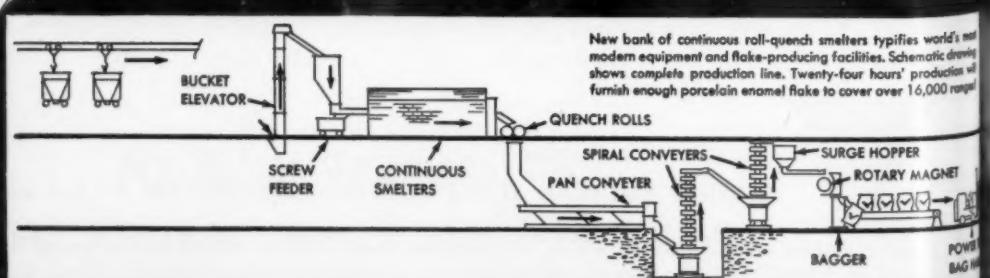
General American's molding facilities can often give your product strength in plastics that will outlast and out-perform conventional materials . . . plus new lightness, beautiful color and big volume production. Ask a General American engineer for ideas to help you.



PLASTICS DIVISION

GENERAL AMERICAN TRANSPORTATION CORPORATION 135 South La Salle Street, Chicago 90, Illinois

• Facilities unmatched anywhere: injection presses to 300 ounces, compression presses to 2,000 tons, reinforced plastics molding, die making, painting, assembly, packaging



New bank of continuous roll-quench smelters typifies world's most modern equipment and flake-producing facilities. Schematic drawing shows complete production line. Twenty-four hours' production will furnish enough porcelain enamel flake to cover over 16,000 square feet.

MEET YOUR GROWING PORCELAIN-ENAMELING NEEDS . . .

Ferro doubles the world's first and most modern flake-producing facilities!

Here at Ferro, we have always geared our operation to anticipating our customers' future needs. That, we feel, is how we've gained our position in the porcelain-enameling field—why we've been able to spearhead so many new frit developments. Now, to keep pace with current developments in the industry, we are in the process of completing *another* big expansion program.

We're doubling our already sizable development facilities by adding a new 17,000-square-foot research and development laboratory . . . extensively modernizing our production facilities . . . expanding warehouse facilities which were already the world's largest!

To get a real "feel" of the almost-immediate impact these developments will have on the enameling industry, you'd have to drop in

on us at Ferro. A brief visit to our research laboratories would show you better than words can tell about the scientific checks used to assure you of the exact characteristics, the precise chemical and physical properties needed for your particular frit formulations. Another brief stop at our newest bank of continuous roll-quench smelters—the most modern equipment of its kind—would show you how far we're going in the direction of new and better machines. And one quick look at our huge frit warehouse would prove to you that you can cut down on your own warehousing expenses, without worry about supply.

If you have any questions at all about what these expanded facilities mean in terms of *your* requirements, pick up the phone or write. We're at your service!



FERRO CORPORATION

PORCELAIN ENAMEL DIVISION • 4150 EAST 56TH STREET • CLEVELAND 5, OHIO
finish SEPTEMBER • 1954

for transportation equipment

that stands up...



FLAT-ROLLED STEEL

produced by a specialist

The kids who roll down Oak Hill in a coaster wagon, and those of us who ride in the world's best automobiles, put a lot of faith in flat-rolled steel.

If you use flat-rolled steel in your products, rely on a specialist—Great Lakes Steel. Our entire organization is devoted to the business of making more and better flat-rolled steel for every application. Many manufacturers have found we have some unique qualifications to help them to improve products and reduce costs. We would like the opportunity to work with you on your problems.

Call on our 25 years of specialization in flat-rolled products. Our representative will be glad to discuss your particular needs at your request.

Great Lakes Steel
Ecorse, Detroit 29, Michigan

PRODUCER OF N-A-X HIGH-TENSILE STEEL

UNIT OF
NATIONAL STEEL CORPORATION

SALES OFFICES IN CHICAGO, CLEVELAND, GRAND RAPIDS, INDIANAPOLIS, LANSING, NEW YORK AND PHILADELPHIA

The ABC's of metal stamping

by James M. Leake •

PRESIDENT, THE LEAKE STAMPING CO., MONROE, MICHIGAN,
AND TECHNICAL CONSULTANT FOR FINISH.

THIS is the first in a series of articles written in non-technical language as a contribution to a more complete understanding of stampings and to assist in the achievement of

greater uniformity of the terminology used in describing the materials, equipment, and operations of the metal stamping industry.

SECTION I — STAMPING TERMINOLOGY

There are many examples of this lack of agreement in the naming of commonly used every day items which serve to emphasize this need. This project, now long overdue, is being undertaken by the Pressed Metal Institute and allied metal working organizations.

Stampings

We will start out with a definition of *stamped or pressed metal products*. *Stampings are basically parts that have been fabricated from rolled material in a punch press, squaring shear, circle shear, trimmer, flanger, roll forming machine, power brake, or equipment primarily associated with the stamping industry*.

Equipment

Even after three quarters of a century in our midst some of the basic parts of a punch press are still known by conflicting names. Some people still prefer to call the slide a ram and others speak of a crown as the arch. Press uprights do not lose their identity if they are called columns.

Dies

Is there anything more thoroughly familiar within the industry than stamping dies, yet how often do we hear guide pins and leader pins used in an interchangeable sense? This might also be expanded to include such words as the anvil, the punch, and the post, either of which may refer to the same part.

Operations

Perhaps in no phase of our indus-

try is there any greater diversity of opinion than in the names describing the scores of stamping operations. Punched holes may be confused with pierced holes and pierced holes have been contending with extruded holes, only finally to be challenged by burred holes.

Some may not realize the difference between impact extrusion and other types of cold extrusion. They may

not know the determining factor between forward and backward extrusion. What are the other types of compression forming? What is the difference between swaging and coining?

Responsibility

This is a project which should present a challenge to all having a stake in an industry that has grown faster than the dictionary. Several articles have been written to encourage a greater interest in improving the terminology that defines our industry and its operations, so that we may continue our irresistible "Advance with Stampings".

SECTION II — STAMPING MATERIALS

The material from which a stamping is made often equals or exceeds the cost of direct labor, therefore care must be exercised in its selection. Fortunately stampings may be made from many choices within each classification of rolled steel, copper, brass and aluminum. Low carbon steel is usually the cheapest to produce, therefore it is more widely used. Other factors such as corrosion, weight, strength or other factors may tip the scales in favor of other metals.

Cold rolled

Material that is rolled cold is, as its name implies, called "cold rolled". This process imparts a finish in varying degrees of brightness. Its surface is scale free. Cold rolled steel may have a tendency to harden with age or cause "stretcher strains" in drawing operations. This condition may be minimized by ordering "aluminum killed" steel or by flexing the material prior to processing in a roller leveler machine.

Hot rolled

Hot rolled steel has a rougher surface than cold rolled because of the scaly surface acquired in the hot rolling process. This scale is removed by pickling when necessary. *Hot rolled* steel has a less desirable surface for bright plating, although it is entirely acceptable for surfaces to be painted. Hot rolled steel may even be preferred for deep drawn parts. Hot rolling is usually confined to 18 gauge and over in thickness.

Classifications

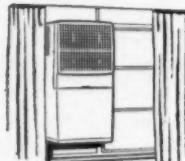
Steel that has been rolled for processing into stampings usually may be classified as sheets, strips, bars or plates. The size of each item and the equipment on which it is rolled has a bearing on the name it is given. Mill specifications must be studied when ordering material in these classifications. *Generally speaking in hot rolled items, strips and sheets are under .230" thick and under 12" wide.*

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FASTEST THING IN FASTENINGS®

Chrysler Airtemp enjoys "refreshing" 40% cost saving!

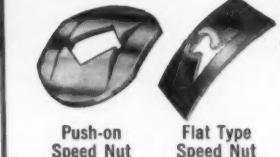


New Casement Window Air Conditioner
assembled at lower cost with 27 SPEED NUTS

Engineers of Chrysler's Airtemp Division, Dayton, Ohio, accepted many of the cost-saving recommendations in a Tinnerman Fastening Analysis Survey on their new Room Air Conditioner for casement windows. This led to the selection of 11 different types of SPEED NUTS to make a total of 27 attachments. The result: an estimated 40% saving in assembly costs over alternate fastening methods!

In addition to the Push-On and Flat Type SPEED NUTS used in the control panel assembly illustrated above, other SPEED NUT brand fasteners provide lightning-fast, corrosion-free, vibration-proof attachments on other sections of the new unit.

A Fastening Analysis of your product can lead to lower costs on current models, even greater savings on new or advanced designs. See your Tinnerman representative for complete details!

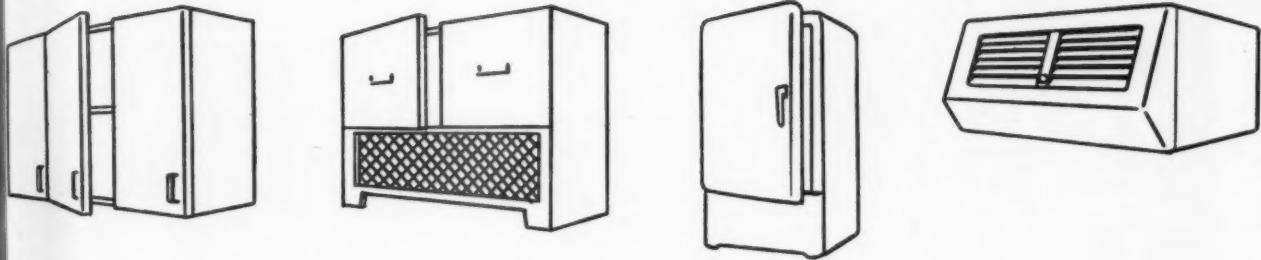


Push-on
Speed Nut Flat Type
Speed Nut

SPEED NUT applications result in substantial savings in assembly time, cost of materials, and materials handling. For example, SPEED NUTS eliminate costly threaded inserts, make faster, easier attachments in blind locations, and permit greater design flexibility. A complete range of types and sizes available.

Write today for your copy of the new Tinnerman Fastening Analysis Service Bulletin Number 336: TINNERMAN PRODUCTS, INC., Box 6688, Dept. 12, Cleveland 1, Ohio. *In Canada: Dominion Fasteners, Ltd., Hamilton, Ontario. In Great Britain: Simmonds Aerocessories, Ltd., Treforest, Wales. In France: Aerocoessories Simmonds, S.A., 7 rue Henri Barbusse, Levallois (Seine).*





Will the permanent magnet replace the mechanical latch?

ENGINEERS throughout the appliance and metal products manufacturing field are working hard to develop the best and most efficient applications for door closures involving permanent type magnets to replace the conventional type mechanical latches which have been used for so many years. It is probable that the next few months will show the extent to which the automatic or magnetic closure, fastener, or catch, will be incorporated in appliances and similar products for 1955.

Some practical applications

Some of the practical applications which already have been used, or are under serious consideration, include refrigerator doors, home freezers, lids or doors for automatic washing machines, directional louvres for room air conditioners, and cabinets for kitchens.

The application which has shown the greatest development and speed in its use is the replacement of the conventional cabinet latch for furniture, kitchen cabinets, etc., by newer type permanent magnet catches.

An open road ahead for engineers

The materials required for successful permanent magnets as required for this application are strategic in nature, and therefore this situation placed a wall around development and use during the war years. Two things have brought the development to the forefront during recent months. First of all, the easing of critical materials (cobalt and nickel) as re-

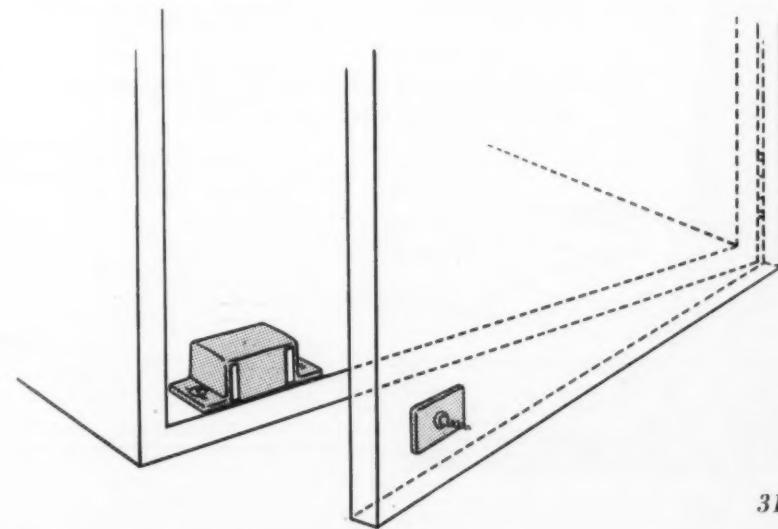
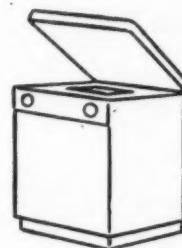
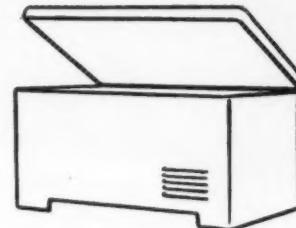
quired for the magnets; second, the development of a ceramic type permanent magnet which includes no critical materials.

Although the magnetic type catches could not be supplied until recently because of restrictions, this did not deter, the engineers, whose job it is to develop uses for permanent magnetic materials, from continuing their experimental work. As a result, there now is an abundance of engineering information available for use by the producers of hardware, or by the manufacturers of appliances and other finished products whose engineers are interested in developing their own application of the materials available.

The new magnetic type catches have an appeal to the engineer for many reasons, but one, to be specific, is the

fact that if a door becomes slightly out of alignment (sufficient to cause difficulty with some conventional type latches), it need have no material

to Page 119 →



PREVENT RUST

with
MACCO BLUCOAT

*the amazing
between-operation
rust proofing
solution*

*MACCO CASE HISTORY

Blucoat is the almost unbelievably efficient and time-tested rust preventive used by leading metal processors and fabricating manufacturers the country over. They endorse its use as the only practical method of preventing rust between production operations and assembly—and during interplant transportation and storage.

5 REASONS FOR BLUCOAT'S NATIONAL ACCEPTANCE:

1. Blucoat is water soluble, making it economical, yet extremely efficient.
2. Blucoat is adaptable to an almost unlimited variety of applications and conditions.
3. Blucoat's powerful rust inhibitor works equally well on steel, cast iron, forgings or die castings.
4. Blucoat leaves no oily film—adheres better to metal—collects less dust, chips, etc.
5. Blucoat has withstood perfectly a salt spray test of more than 80 hours. Vastly superior to soluble oil, it contains no poisonous elements. No alcohol, making it exceptionally stable.

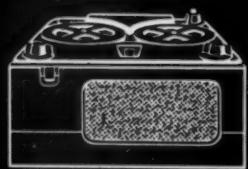
For the prevention of rust, Blucoat positively has no equal. Whether the product be the finest of automobile bodies or simply bale tie-wires, Blucoat's versatility makes it most indispensable for any metal processing plant.

Write today or call a Macco sales engineer. Phone Prescott 9-0800, Chicago.

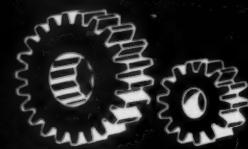
*Actual Case History available on request.

MACCO
PRODUCTS COMPANY

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RECORDER precision parts are being given the Macco Blucoat Rust Preventive treatment by one of the nation's leading electronic manufacturers.



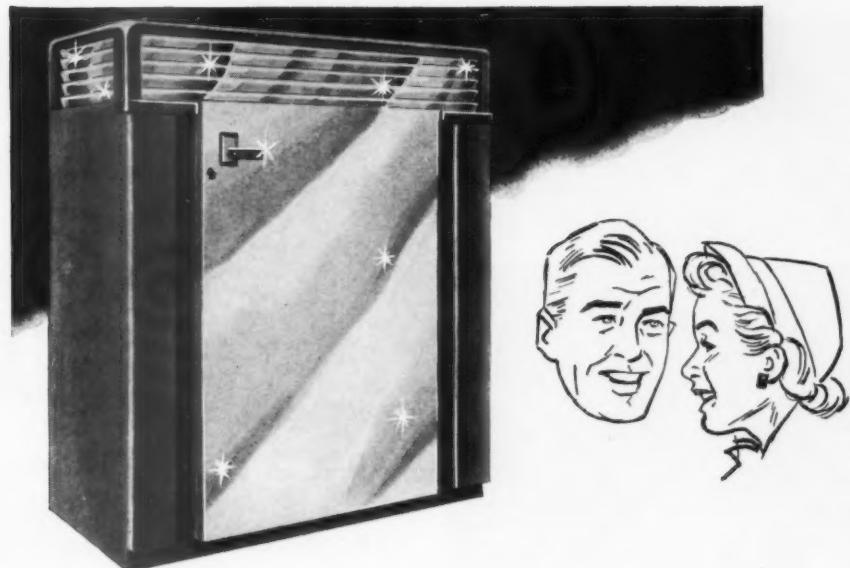
GEARS cut, ground and tempered are treated with Blucoat to prevent rust during storage, shipping and assembly.



CARBURETOR bodies and large engine castings being treated with Macco Blucoat to prevent rust after machining and during storage.



AUTO bodies of one of the world's largest body manufacturers are given the Blucoat treatment to prevent rust before painting.



ENDURO BRIGHTWORK . . . gets them all talking SALES



People are favorably impressed by well-chosen ENDURO Stainless Steel brightwork. It's an unmistakable sign of top quality in a manufactured product. It's a point to talk about as another reason for choosing your line.

And, there's no reason why your products shouldn't have this sales advantage *now*. You and your suppliers can fabricate ENDURO Stainless Steel on your present equipment with little or no change in procedures. There's no plating, painting or other finishing needed. As compared with forming, then cleaning, then plating, then polishing; cost is very attractive.

With ENDURO, you have brightwork that stays bright. It resists rust and corrosion, doesn't tarnish. It has no plating to chip, peel or flake. It's superbly easy to clean and to keep clean. It stays bright for the life of the product.

When your sales staff can point out to distributors and jobbers that your brightwork is genuine ENDURO Stainless Steel . . . when distributors can tell dealers . . . when dealers can tell their customers . . . and housewives can tell one another . . . then you've got them all talking sales! Republic will help you choose proper ENDURO Types and fabricating procedures. *Write:*

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Other Republic Products include Carbon and Alloy Steels—Pipe, Sheets, Strip, Plates, Bars, Wire, Pig Iron, Bolts and Nuts, Tubing

finish SEPTEMBER • 1954

How are Your Baking or Drying Costs?



Photos of Sub-Zero Freezer cabinets drying the Burdett way in 20 min. at 325° F. Higher gloss than usual and a harder finish is also claimed.

The **BURDETT**
(Gas-Fired)
"Radiant Heat"
OVEN

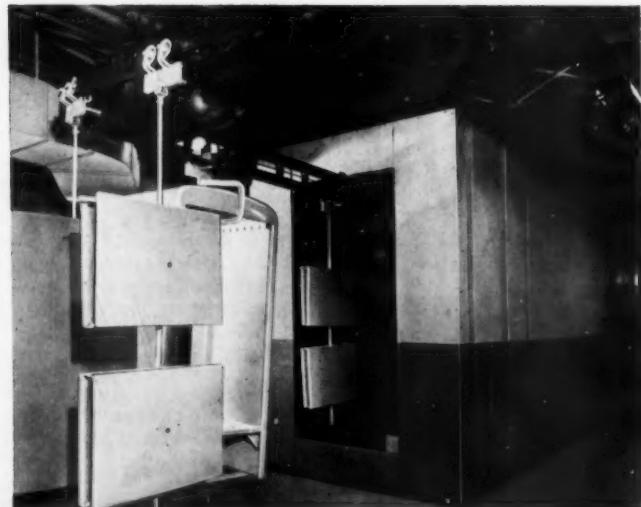
... betters conventional

methods by

30% to 70%

It's a story that has been told and proved over and over again — 30% to 70% savings in costs and a better product also. In a Burdett "Radiant Heat" Oven the temperature remains uniform from top to bottom — an even bake at all times. Combustion is more complete than in any other type of oven — therefore, important fuel savings. Run any combination of colors through simultane-

ously with perfect results. A Burdett "Radiant Heat" System can be installed in your present oven or be engineered as a completely new finishing system. Send your paints and samples of your products — or, bring them to our laboratories for proof of these and many other advantages before you sign on the dotted line. A test run will convince you — do it now! No obligation.



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Manufacturers of
OVENS, "RADIANT HEAT" SYSTEMS, HEATERS, WASHERS,
SPRAY BOOTHS AND AIR MAKE-UP UNITS.

from the beginning



DULUX *Amana*

REG. U. S. PAT. OFF.

From the beginning Du Pont "DULUX" White Enamel has played an important part in the growth of the "Amana" Home Freezer. Housewives prefer DULUX because they know:



DULUX is easy to clean—A little warm water and mild soap quickly and thoroughly chase dirt. The exceptionally smooth, hard DULUX Enamel finish offers little opportunity for dirt to "anchor" and collect.



DULUX resists chipping—Amazing flexibility is a characteristic of DULUX Enamel. Metal protected with this Du Pont finish may be bent or dented—and the DULUX finish won't crack or flake off.



DULUX resists grease—Cooking fats spoil the initial beauty of ordinary enamels. DULUX-finished panels can be soaked in a mixture of oleic acid and cottonseed oil for 3 or 4 days—and the finish doesn't soften.

DULUX resists moisture—The baked DULUX Enamel film effectively resists the action of moisture. Were it not for this important DULUX barrier, kitchen steam and moisture would soon corrode and rust the metal.



BETTER THINGS FOR BETTER LIVING
... THROUGH CHEMISTRY

DULUX enamel

REG. U. S. PAT. OFF.

America's leading home appliance finish
CHEMICALLY ENGINEERED TO DO THE JOB BETTER





Finishing operations at Amana

completely conveyorized two-coat finishing system includes electrostatic spraying in a set-up with the versatility to handle a variety of sizes and shapes in metal components for home freezers and air conditioners

Part II of a series

IN THE recently expanded Amana Refrigeration plant at Amana, Iowa, is a completely new conveyorized paint finishing system which has speeded the painting process to the point where one shift in the paint department finishes as many freezers as were handled by two shifts former-

ly, according to Neal Stewart, paint superintendent. In addition, room air conditioners are now being finished in the same department.

Requirements within the department include the finishing of eight different freezer models, ranging in size from 8 cu. ft. chests to 25 cu. ft.

uprights, in two colors — gray and white. The finish is applied to these parts in an automatic, electrostatic installation.

In addition to the freezers, room air conditioner cabinets and 35 other parts are rust-proofed, hand-sprayed, and hand-dipped, prior to baking.

One of the most important requirements for the paint system is versatility because of the wide range of components to be finished and the extremely large size of some of the parts. The system was designed so that changes from model to model can be readily made. Since storage space for finished parts limits inventory to a maximum of two hours of production line activity, the new finish system must handle relatively short runs of each model and make the change from model to model in minimum time. The two-story painting and enameling department, which continuously feeds parts for three assembly lines, was installed at a cost of \$400,000. Total number of components finished in the plant, including those electrostatically sprayed, and those which are hand-sprayed or dipped, totals approximately 100. Major components, such as upright and chest freezer cabinets, doors, liners, lids, etc., are transported on an overhead conveyor.

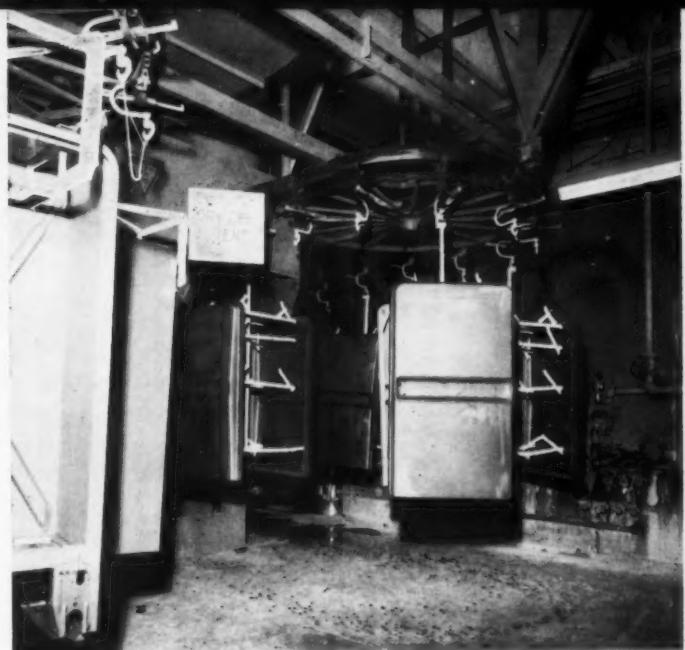
The electrostatic system is set up so that quick shifts can be made between parts of different size and shape to promote optimum efficiency in the application of the finish.

Finishing routine

Following metal finishing operations (see preceding article in August *finish*), parts to be painted are loaded on a 2700 ft. conveyor at a point adjacent to the metal finishing area. The finishing conveyor has two drives and two take-ups, with trolleys spaced at 24" centers. In order to prevent some of the large parts from turning in the power washer, each swivel conveyor hook has a small hole drilled through it and a spring steel pin inserted. This pin is removable to permit the hangers to revolve when the finish is applied.

The cleaning and phosphatizing section of the finishing department includes a 5-stage system as follows:

#1 — Alkali Cleaner	... (160° F.)	.60 sec.
Drain	.....	.50 sec.
#2 — Hot Water Rinse	... (160° F.)	.60 sec.
Drain	.....	.50 sec.
#3 — Zinc Phosphatizing Solution	..... (145° F.)	.60 sec.
Drain	.....	.50 sec.
#4 — Cold Water Rinse	.....	.30 sec.
Drain	.....	.50 sec.
#5 — Chromic Phosphoric Acid Rinse	.... (100° F.)	.30 sec.
Drain	.....	.50 sec.



Doors for upright freezers are shown passing into the dry-off ovens which are part of the phosphatizing process.

Upright freezer cabinets are shown emerging from the equipment used for jet-spray application of cleaning and phosphatizing solutions. Hanging between the two freezer cabinets can be seen curved parts and fan housings for room air conditioners.



DESPATCH OVEN COMPANY

Congratulates

AMANA REFRIGERATION, INC.

ON COMPLETION OF A MAJOR EXPANSION PROGRAM

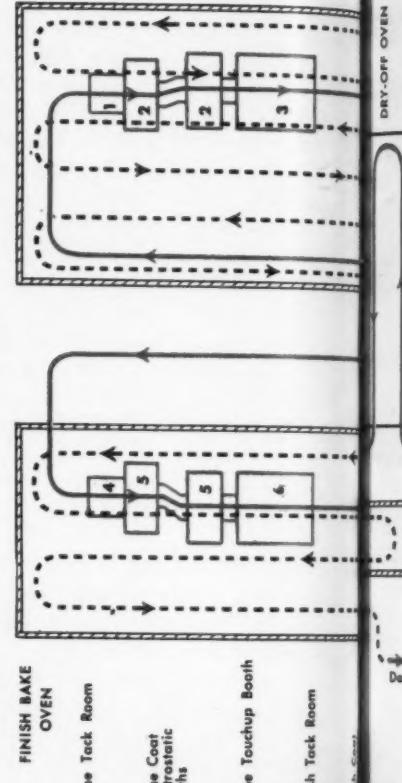
The year 1954 brings to completion a major plant expansion program at Amana Refrigeration, Inc., Amana, Iowa, world's largest manufacturer of food freezers and pioneers of the Amana upright freezer.

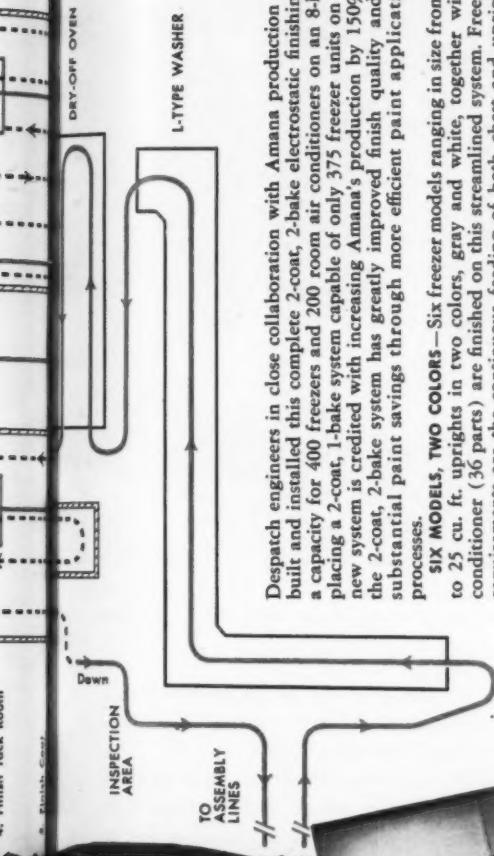
Despatch Oven Company is proud of its part in the production of Amana freezers and the new Amana room air conditioners. A Despatch Finishing System now puts the beautiful, high quality, long lasting baked enamel finishes on these traditionally fine products, and does it with the speed necessary to supply the ever-growing demand for distinctively styled and functionally designed home appliances. We feel honored to have a part in the Amana operation, where craftsmanship is a tradition and where the pride of skilled men is exemplified by strict adherence to rigid specifications and superlative workmanship.

We salute Amana on the completion of their major expansion program and wish them continuing success with even greater triumphs in the years ahead.



World's Largest Manufacturer of Food Freezers
INCREASED PRODUCTION 150% WITH THIS
DESPATCH Conveyored FINISHING SYSTEM!





Despatch engineers in close collaboration with Amana production men, designed, built and installed this complete 2-coat, 2-bake electrostatic finishing system with a capacity for 400 freezers and 200 room air conditioners on an 8-hour shift. Replacing a 2-coat, 1-bake system capable of only 375 freezer units on two shifts, the new system is credited with increasing Amana's production by 150%. In addition, the 2-coat, 2-bake system has greatly improved finish quality and has achieved substantial paint savings through more efficient paint application and paint processes.

SIX MODELS, TWO COLORS—Six freezer models ranging in size from 8 cu. ft. chest to 25 cu. ft. uprights in two colors, gray and white, together with a room air conditioner (36 parts) are finished on this streamlined system. Freezer production requirements are the continuous feeding of both chest and upright parts for 3 assembly lines. Travelling on a 2700-ft. continuous conveyor, the ware is passed through a 5-stage metal washer, 2-pass dry-off oven, electrostatic prime coat booths and hand touch-up booth, multiple-pass prime bake oven, electrostatic finish coat booths and hand re-inforcing booth, multiple-pass finish bake oven and then thru the inspection area and to the assembly lines. Following metal washing and dry-off, the air conditioners parts are taken from the line for dip coating and returned to the line for touch-up, baking and unloading at assembly points.

Lack of storage space for finished parts limits the inventory to not more than two hours of production. This means a finishing system capable of handling relatively short runs of each model and making the change from model to model with ease. The capacity to finish a variety of model sizes, and in two colors makes this Despatch installation unique and one of the most versatile of its kind in operation today.

CALL DESPATCH FOR A COMPLETE FINISHING SYSTEM OR A SINGLE UNIT

Despatch Finishing Systems are designed and built to finish your product better, faster and more economically. You can get a complete system or individual units, such as:

BAKE OVENS, DRY-OFF OVENS, SPRAY BOOTHS, FLOW COATERS
CONVEYORS, AIR MAKE-UP SYSTEMS, WASHERS

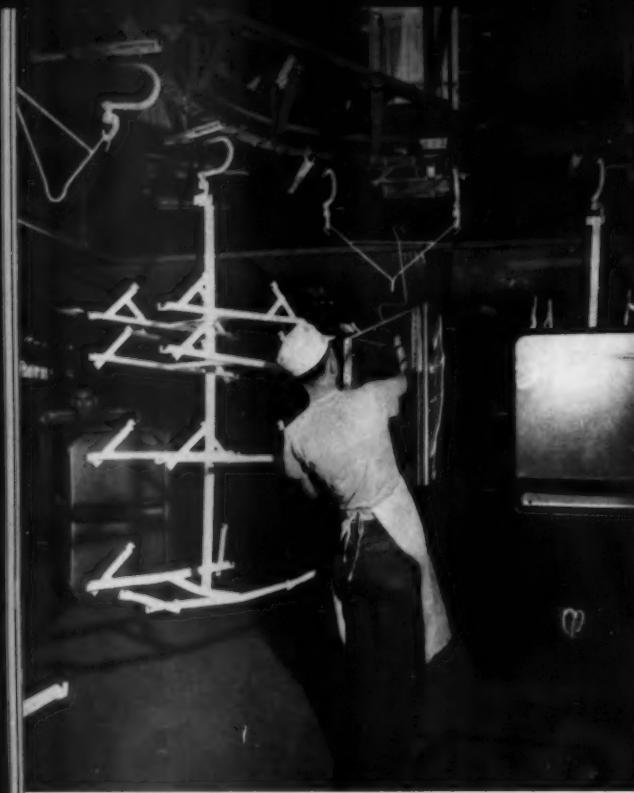
DESPATCH OVEN COMPANY

Chicago Office * 4554 N. Broadway.
Minneapolis Office 619 S. E. 8th St.
Sales and Service in All Principal Cities

Resident engineers located in your vicinity are ready to help with your finishing problems. Write to Dept. R.



There are two prime coat and two on bake. There are two on prime coat and two on bake. Each booth sprays 7 parts on the bottom coat. Each booth has a hand re-inforcing booth on the top coat. All booths are identical sizes. Ware goes thru hand re-inforcing booths and finish lines. All lines, white, gray, black, white and finish lines have 4 fluid lines. Each booth has a hand re-inforcing booth and a hand re-inforcing booth.



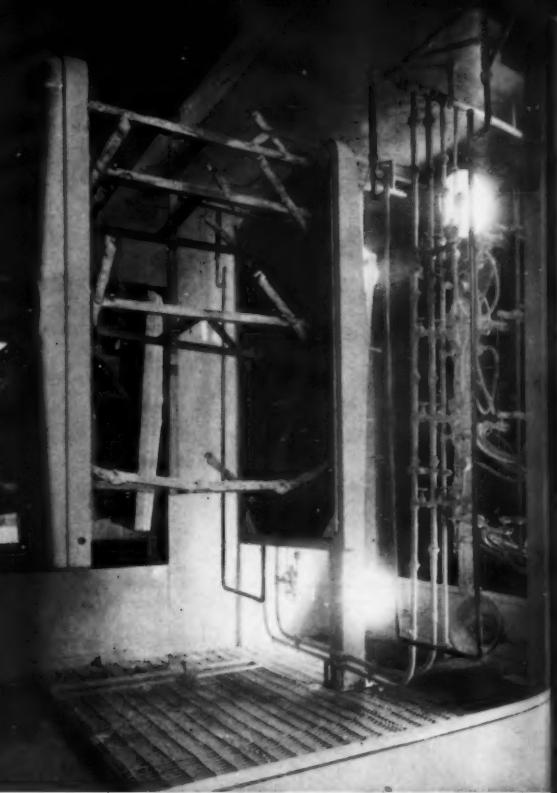
Between runs of freezers, an outer cabinet for a room air conditioner is hung on conveyor leading to finishing process.

The demineralizer is a self-contained unit, delivering 500 gallons per hour, and approximately 6,000 gallons between regenerations. Seventy feet of conveyor is provided for drain after the ware leaves the washing and phosphatizing equipment. Compressed air is then used to re-

move any moisture trapped in corners where it will not drain properly.

A jet nozzle system is used for application of the solutions in the cleaning and phosphatizing unit. Ample ventilation is provided at the entrance and exit of the unit through the use of large capacity exhaust fans.

At this control station, operator carefully regulates conditions in the drying ovens.



Here freezer doors, moving on an overhead conveyor, are about to be sprayed by electrostatic process.

Final drying is accomplished in a gas-fired oven providing 6 minutes drying time at 300° F.

As cabinets are conveyed through the power washer, they are hung right side up to promote draining, but as they emerge from the dry-off oven, they are reversed for spraying.

In this "hot box", metal parts with various types of finish are tested for paint blistering and other deterioration.



In order to minimize set-up changes in the electrostatic system, part size variations are handled by "batching" production in one of three classifications of parts grouped according to size.

Conveyor tooling is likewise standardized for part "groups." One type of hanger accommodates all of the different models of upright cabinets, while another type of adjustable arm hanger accommodates all of the doors and a variety of other parts for chests and uprights. This latter hanger can be made wide or narrow, so the doors can be hung at a width corresponding to the width of the cabinet that it is accompanying in production.

Both prime and finish coat booths are identical, except that the finish booths have two fluid lines — one for gray, and one for white. The ware passes from the spray booths through enclosures extending up to the elevated ovens.

"Upstairs" ovens

Finishing ovens and air replacement units are located on the second floor above the paint application equipment. Prime coat baking temperature is 345° F., and finish coat

temperature is 300° F. Prime and finish ovens are identical in equipment and capacity. They are "A" type design, multiple-pass units, housing 450 ft. of monorail. Each oven has two direct gas fired burners with a combination of instruments which will shut off the gas supply if there is failure of exhaust fans, electric current, gas pilot, gas pressure, or in the event of overheating. As an additional precaution, a time delay relay makes it impossible to light the gas until the supply and exhaust fans have run for a predetermined period of time for proper ventilation of the oven.

Ovens are of sheet metal panel construction, including three inches of rock wool insulation. Joints are telescoped to automatically take care of contraction and expansion. Each oven is equipped with explosion proof lights and observation windows.

Air replacement units

Outside air is drawn in through large fresh air inlets projecting through the building roof. This replacement air passes through continuous oil bath filters over gas heaters and then through replacement

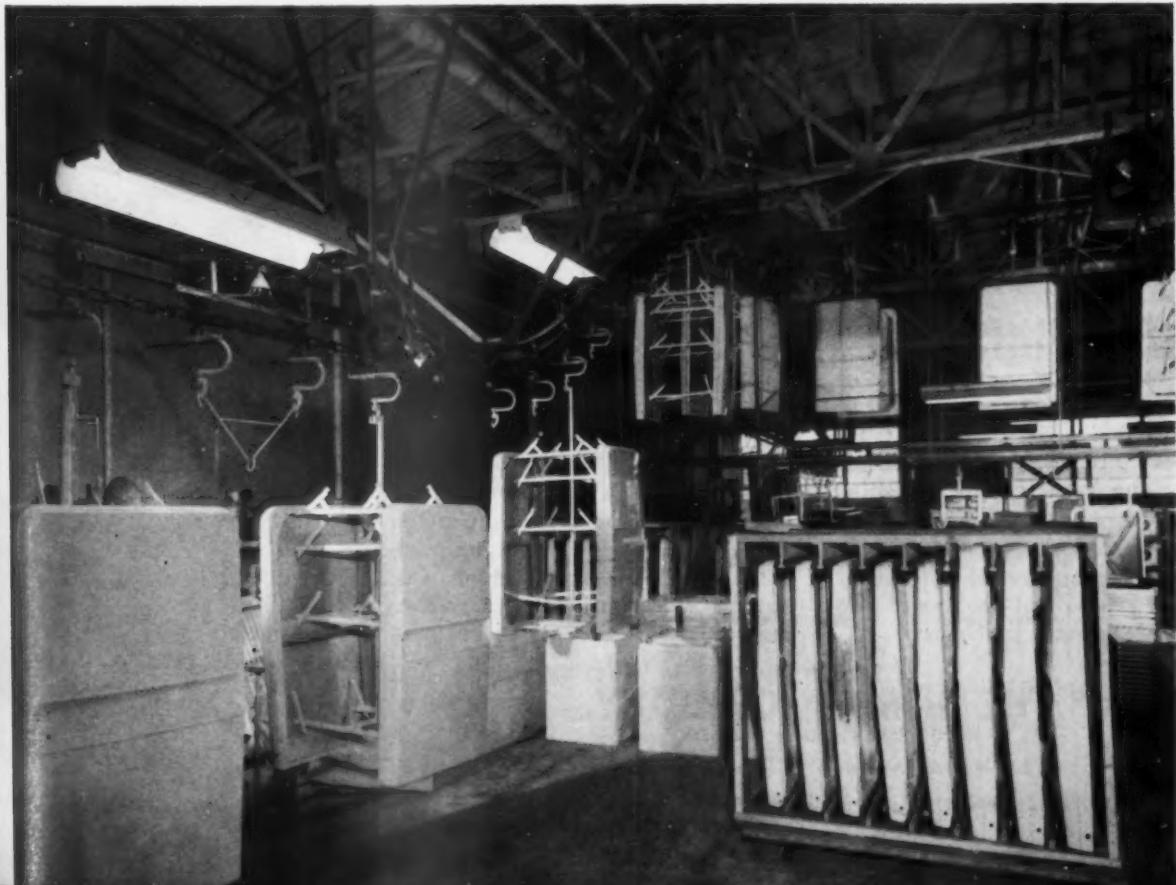
type filters to spray booths and pressurized areas. Three separate air replacement units are used to supply the air for spray booths and other pressurized room areas.

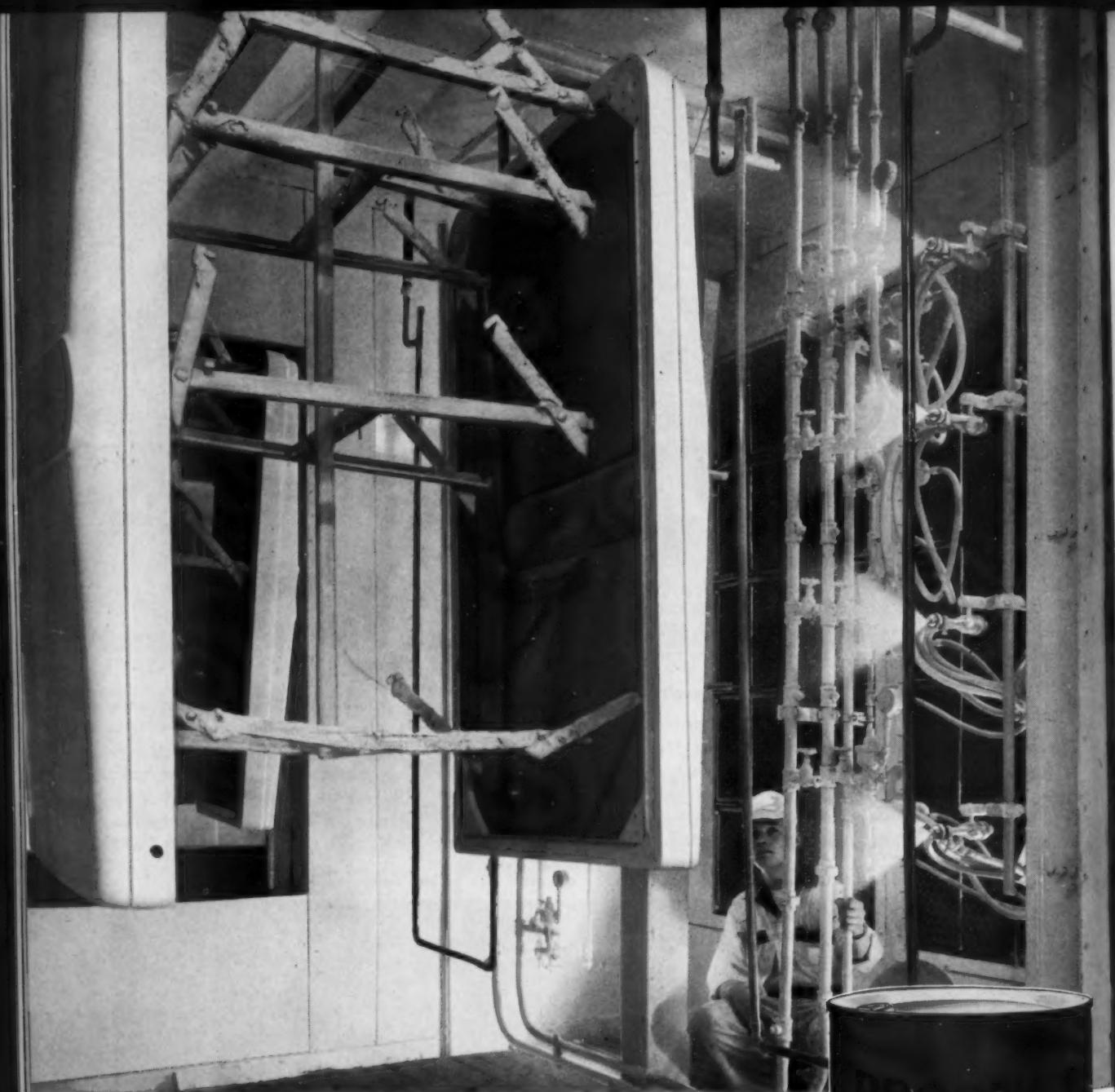
A paint storage and mixing room is centrally located to supply materials to the spray equipment. Fifty-foot long storage racks are installed so the drums are rolled toward the mixing tanks as they are needed, automatically using the oldest paint stock first. Ten mixing tanks prepare the prime coat and different finish coat materials. Three separate filtering systems are used. The paint is first filtered before entering the mixing tanks, then, on the circulating lines, and again through the use of cartridge filters at the spray booths. Paint heaters are used on the circulating lines to bring the temperature of the fluid up to 170° F. from the 80° temperature maintained in the mixing room.

Close inspection of film thickness is observed. As the parts merge from the finish coat oven, film thicknesses are spot checked. Standard provides for a total thickness of 2 mils, combining .8 to 1 mil thickness for

to Page 118 →

Finished freezer doors are delivered to the assembly line on this overhead conveyor.





FASTER FINISHING FOR FAMOUS FREEZER

The completion of a new automatic finishing line at Amana Refrigeration Inc., has given this pioneer builder of upright freezers many finishing advantages.

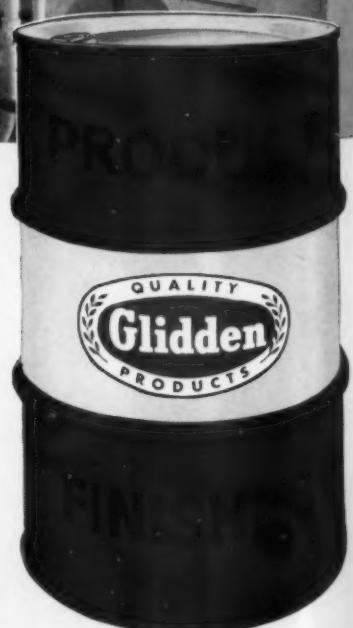
The switch-over to an electrostatic spraying system speeded production, reduced rejects and eliminated several costly finishing problems.

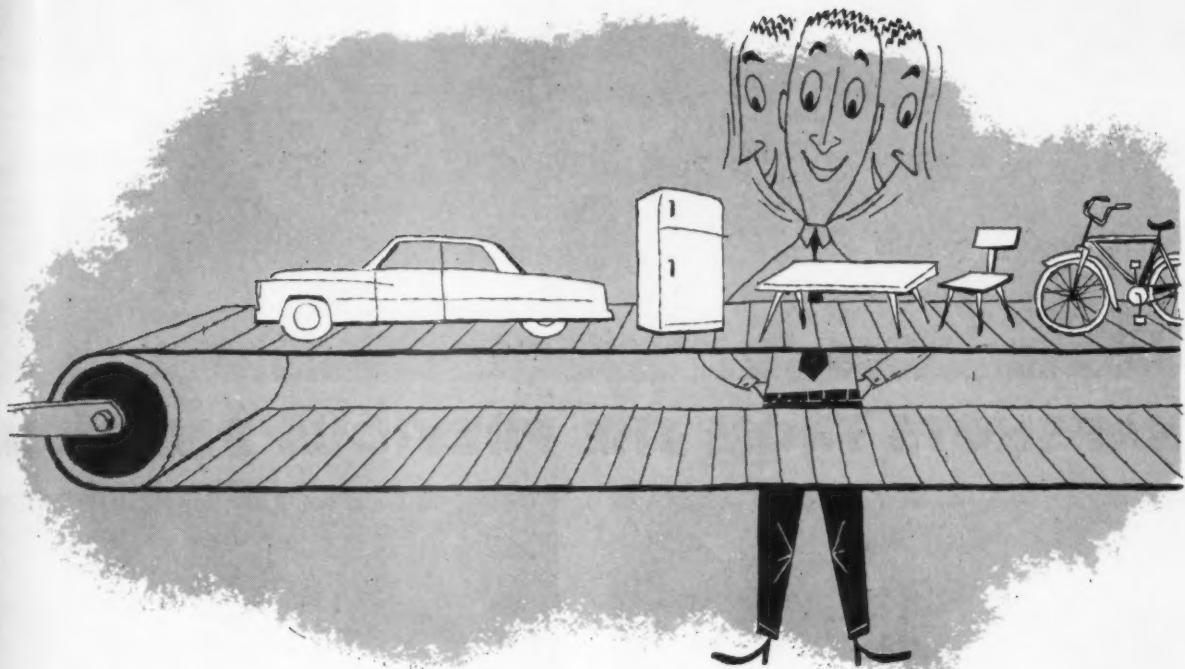
Many of the recommendations which have proved so successful were made by Glidden Technical Service men. This is consistent with the type of start-to-finish help G. T. S. provides in improving finishing procedures, increasing product quality and lowering finishing costs. Call on Glidden *first* for all your finishing needs.

THE GLIDDEN COMPANY INDUSTRIAL FINISHES DIVISION

11005 Madison Avenue • Cleveland 2, Ohio

SALES OFFICES AND FACTORIES: San Francisco, Los Angeles, Chicago (Nubian Division—1855 North LeClaire Avenue), Minneapolis, St. Louis, New Orleans, Cleveland, Atlanta, Reading, Canada: Toronto and Montreal





TITANOX® IS PRODUCTION-LINE WHITE MAGIC for organic and inorganic finishes

Be sure you use TITANOX in your production-line finishes, because only TITANOX assures you of getting the most out of magical titanium dioxide.

For organic finishes, three rutile pigments stand out: TITANOX-RA, TITANOX-RA-50 and TITANOX-RA-NC. With these easy mixing, easy dispersing pigments you can obtain the exact qualities of brightness, whiteness, opacity, fade- and chalk-resistance you desire.

For porcelain enamels, TITANOX-TG and TITANOX-TG-400 stand out as products made

specifically for the frit maker. Easy to use, these unique products assure uniformity of all titania porcelain enamel properties.

You can get more out of titanium dioxide, too, by consulting our Technical Service Department. Titanium Pigment Corporation, 111 Broadway, New York 6, N. Y.; Atlanta 2; Boston 6; Chicago 3; Cleveland 15; Los Angeles 22; Philadelphia 3; Pittsburgh 12; Portland 9, Ore.; San Francisco 7. In Canada: Canadian Titanium Pigments Limited, Montreal 2; Toronto 1.

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brightest name in the finish



2301-A

TITANIUM PIGMENT CORPORATION
 Subsidiary of NATIONAL LEAD COMPANY



SNAPSHOTS FROM THE PREVIOUS PEI FORUM



finishfotos



Program for PEI forum for plant men

annual shop practice forum to be held at the University of Illinois

THE 16th annual Shop Practice Forum of the Porcelain Enamel Institute will be held September 8, 9 and 10 at the University of Illinois, Urbana, Illinois.

ADVANCE PROGRAM

Wednesday Morning, September 8

10:00 Registration — Animal Sciences Building

10:30 Meeting of Committees

Wednesday Afternoon, September 8

Presiding

Dr. A. I. Andrews
University of Illinois

1:30 Address of Welcome.....Dr. Lisle Abbott Rose
University of Illinois

Response.....W. A. Barrows
Barrows Porcelain Enamel Company;
President, Porcelain Enamel Institute

2:00 WHAT'S NEW IN THE INDUSTRY — Five Minute Reports

This entire session is devoted to concise reports on latest industry developments. These presentations are limited to five minutes each, with five minutes discussion to follow each report, and aim to summarize the progress and present status of topics of current interest to the industry.

Continuous Dew Point Meter
for Dryers and Furnaces.....L. C. Farrow,
Clyde Porcelain Division, Whirlpool Corp.

Reflective Bead Enamels.....D. C. Bowman
Chicago Vitreous Corporation

Mechanical Method for Determining Pick-Up.....H. S. Saunders,
The O. Hommel Company

Use of Organic Dies as a Spraying Aid.....G. S. Martin,
Pemco Corporation

Addition of Water to Furnace Atmospheres.....R. P. McCook,
Geo. D. Roper Corporation

Two Years of Infra-Red Drying.....F. O. Mahery, Jr.,
The Athens Stove Works, Inc.

Effect of Mill Additions on Abrasion Resistance.....R. A. Smith,
Murray Corporation of America

Observations on Field Experiences
of Enameling Ranges.....J. R. Crandall,
National Bureau of Standards

Acid Additives.....Alexis Hannan,
Heintz Manufacturing Company

Progress Report on High Temperature Coating
of Furnace Tools.....T. F. Mueller,
Ferro Corporation

"Did You Know That . . . ?" — session on 30-second
helpful hints.....J. J. Svec,
Ceramic Industry

Automation in the Enameling Industry.....Robert Shlivak,
Ferro Corporation

Shop Experiences in Enameling of Aluminum.....H. V. Penton,
California Metal Enameling Company

Instrument Measurement of White Porcelain
Enamels.....Clark Hutchison,
Ingram-Richardson, Inc.

Note: The last three papers will be 15-minute reports.

finish SEPTEMBER • 1954

Thursday Morning, September 9

9:30 PROCESSING METHODS IN THE ENAMELING INDUSTRY

Session Chairman: J. L. McLaughlin
Dana Chase Publications

Data Controlled Spraying.....J. J. Baker,
International Harvester Company

Electrostatic Spraying of Porcelain Enamel.....M. L. Pouilly,
The Illinois Spray & Equipment Company

Practical Aspects of Dipping.....Paul S. Cecil,
Seaporce Metals, Inc.

10:40 PROCESSING METHODS — (continued)

Session Chairman: E. E. Howe
Chicago Vitreous Corporation

Guide Posts in Enameling Hot Water Tanks.....D. R. Goetchius,
Ferro Corporation

Fundamentals of Metal Cleaning.....G. A. Lux,
Oakite Products, Inc.

2:00 COLOR FROM THE SHOPMAN'S VIEWPOINT

Session Chairman: J. B. Willis
Pemco Corporation

Introductory Remarks.....J. B. Willis,
Pemco Corporation

An Editor's Report on Color.....Dana Chase,
Finish Magazine

Coloromics.....Dr. Ralph L. Cook,
University of Illinois

How to Choose the Proper Materials
for Your Color Production.....E. R. Bullard,
B. F. Drakenfeld & Co., Inc.

The Use of Instruments in Color Control.....Dr. R. F. Patrick,
Pemco Corporation

Mass Production of Colored Appliances.....John Vennetti and Robert J. Baker,
Frigidaire Division, General Motors Corp.

Friday Morning, September 10

9:30 REPORT ON PRACTICAL TESTS FOR THE ENAMELER

Session Chairman: Dr. G. H. Spencer-Strong
Pemco Corporation

Observations in Abrasion Testing.....J. H. Giles,
PEI Research Associate, National Bureau of Standards

Demonstration of PEI Abrasion Tester.....E. C. Aydelott,
Murray Corporation of America

Measurement of Glass.....Dr. G. H. Spencer Strong,
Pemco Corporation

Measurement of Alkali Resistance.....J. T. Roberts,
Crane Company

10:50 REPORT ON ONE-COAT ENAMEL DIRECT TO STEEL

Session Chairman: J. F. Matejczyk
The O. Hommel Company

The Cause, The Effect, The Cure.....J. C. Eckel

Processing Variables in One-Coat Application
in the Utensil Field.....Dr. A. L. Friedberg,
University of Illinois

Observations in Application of White Porcelain
Enamel Direct to Steel.....Francis Ellinger,
Ferro Corporation

1:00 ADJOURNMENT



DEFECTIVE PLUMBING-WARE



DEFECTIVE WASHERS AND RANGE TOPS



THE CAUSTIC BATH



THE WASH-OFF



SANDBLASTING

D-ENAMELING SAVES UP TO 50% OF ORIGINAL PART COST

Over the past three years, D-Enameling has more than proved its dollars and cents value to manufacturers of ranges, bathtubs, sinks, refrigerator liners and washing machine tubs. Before D-Enameling, these manufacturers had to scrap defective parts. All the material and labor that went into them was a complete loss. Now, for a small cost, these same manufacturers are able to transform defective parts into first line salable, profit-building products. To cost-conscious management it is obviously smart business to spend a few dollars to save many more. One stove manufacturer, for example, through D-Enameling has been able to save as much as 50% of the original cost of range tops. If you're interested in cutting costs, it will pay you to find out about D-Enameling now. You'll be agreeably surprised how much the simple economics of D-Enameling can benefit you.

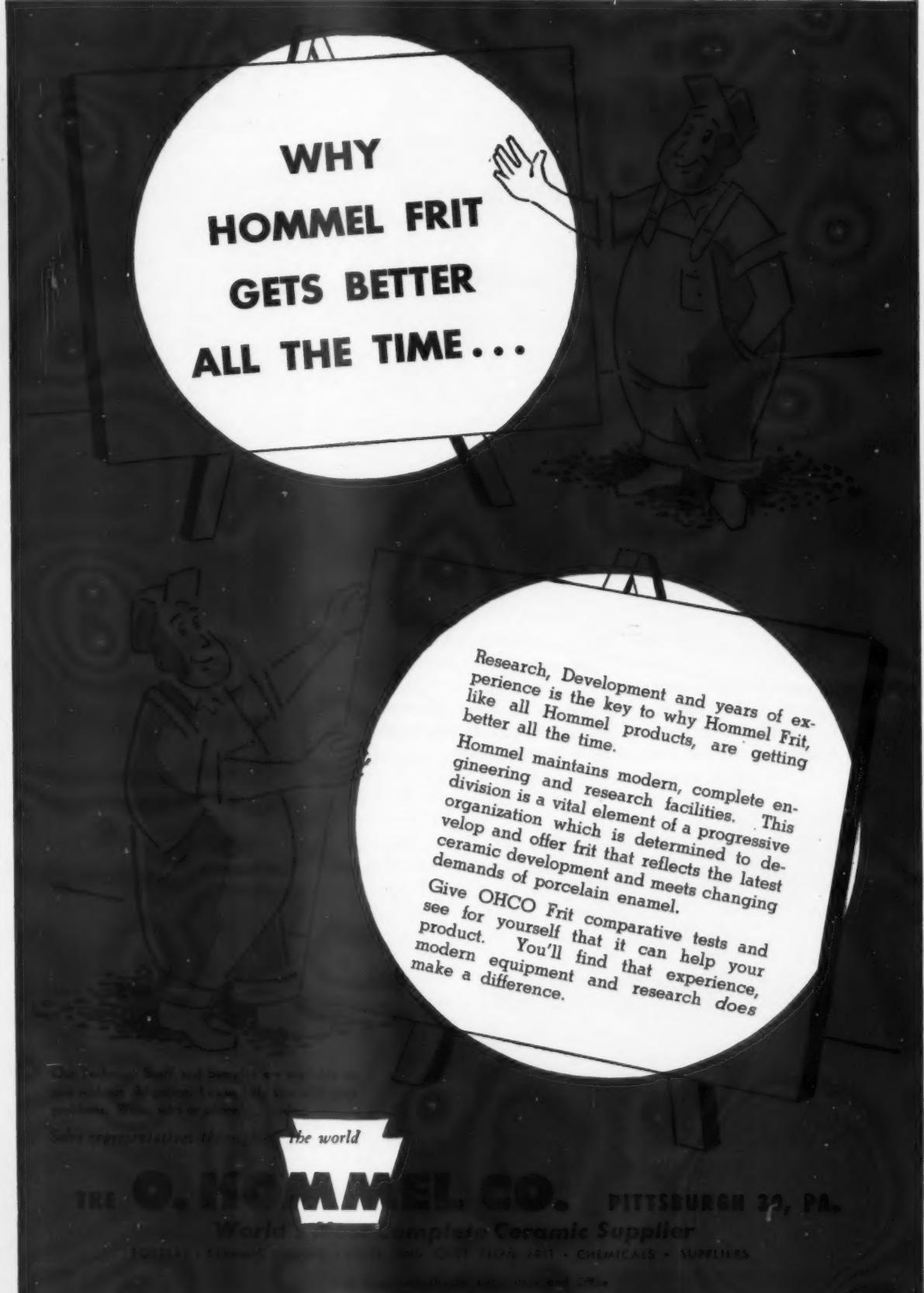
May we discuss this soon?

THESE INDUSTRY LEADERS KNOW FROM EXPERIENCE THAT D-ENAMELING TRANSFORMS SCRAP LOSS INTO PROFIT DOLLARS

ARROW SIGN CO. • BRIGGS MANUFACTURING COMPANY • CAPITAL AIR-LINES • CHALLENGE STAMPING & PORCELAIN CO. • CLEVELAND-TENNESSEE ENAMEL COMPANY • CLYDE PORCELAIN STEEL DIV. • CONLON-MOORE CORPORATION • CRIBBEN AND SEXTON COMPANY • CROWN STOVE WORKS • DWYER PRODUCTS CORPORATION • ESTATE HEATROLA DIVISION • FLORENCE STOVE COMPANY, Kankakee • GENERAL PORCELAIN ENAMELING AND MANUFACTURING COMPANY • GIBSON REFRIGERATOR COMPANY • GLOBE AMERICAN CORPORATION • GRAY & DUDLEY CO. • ICE COOLING APPLIANCE CORPORATION • A. J. LINDEMANN & HOVISON COMPANY • MAGIC CHEF INC. • MALLEABLE IRON RANGE COMPANY • MAYTAG CO. • NORGE DIVISION, Effingham • NORGE DIVISION, Muskegon Heights • PRENTISS WABERS PRODUCTS CO. • GEO. D. ROPER CORPORATION • RHEEM MANUFACTURING CO. • SAMUEL STAMPING & ENAMELING CO. • A. O. SMITH CO. • THE ENAMEL PRODUCTS COMPANY • THOR CORPORATION • TYLER FIXTURE CORPORATION, Waxahachie.

New Process D-Enameling Corp.

Highland and New Haven Avenues • Aurora, Illinois



WHY HOMMEL FRIT GETS BETTER ALL THE TIME...

Research, Development and years of experience is the key to why Hommel Frit, like all Hommel products, are getting better all the time.

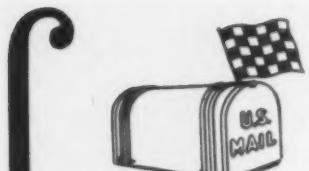
Hommel maintains modern, complete engineering and research facilities. This division is a vital element of a progressive organization which is determined to develop and offer frit that reflects the latest ceramic development and meets changing demands of porcelain enamel.

Give OHCO Frit comparative tests and see for yourself that it can help your product. You'll find that experience, modern equipment and research does make a difference.

Our technical staff is always available to help you solve your problems. Write, wire or phone.

Sales representation throughout the world

THE O. HOMMEL CO. PITTSBURGH 39, PA.
World's Complete Ceramic Supplier
FIRECLAY - STONEWARE - CERAMIC GLASS - FRICTION FRICTION - CHEMICALS - SUPPLIERS



finish SUGGESTION BOX

New treatment simplifies enameling of aluminum - no pre-fire necessary

A NEWLY-DEVELOPED product is said to answer the need for a simple, economical treatment for aluminum prior to enameling.

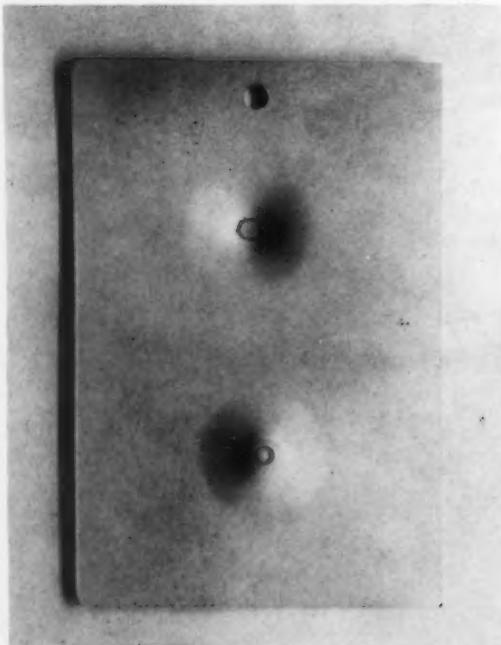
Pre-firing is said to be unnecessary with the new product known as "Pre-Namel 420". The bath is controlled by simple chemical tests, and can be used indefinitely. Elimination of pre-firing is claimed to represent an effective increase of 25% or more in production with existing furnace equipment.

Results of control tests indicate the bonding effectiveness of the pre-treatment. In the PEI impact test, a 3½-pound weight was dropped from

a height of 12 inches onto a ½-inch steel ball on the test panel. The porcelain enamel cracked only slightly, and virtually no ground coat parted from the metal.

The accelerated spalling test was used to test the resistance of the enamel system to weathering. After the edges were sheared to insure a clean interface, enameled panels were immersed in a 5% ammonium chloride solution. Enamel loss along the edges, after 96 hours test, was nil.

Source for more information on this pre-treatment may be obtained by writing to **finish**.



PEI impact test, in which a 3½-pound weight is dropped onto a ½-inch steel ball, shows how tightly porcelain enamel is bonded to the aluminum, using the new pre-treatment.

WEAVER LISTS ARCHITECTURAL PORCELAIN TECHNOLOGICAL ADVANCES

"Technological advances in achieving lightness, permanence and the ability to hold color explain the sudden emergence of porcelain enamel as a major architectural medium", Robert A. Weaver, Jr., president of Bettiner Corp., Waltham, Mass., told members of the New York Society of Securities Analysts recently.

Weaver pointed out that "more has been done with porcelain enamel in the past four years than in the previous four thousand, ever since the ancient Egyptians added a brightly colored glaze to their delicately shaped jars and vases."

As an example of what porcelain enamel can do for the construction field, he discussed a new 2½" thick "curtain wall" panel developed by Bettiner which is equal in insulation to a standard masonry wall of a thickness from ten to twelve inches. Since the curtain wall is far lighter in weight, it requires a much less costly steel frame, can be installed more rapidly and needs no maintenance whatsoever. This kind of saving in time, labor and money, according to Weaver, opens a number of new horizons for the entire building industry.

During his talk, Weaver revealed two new uses of porcelain enamel: at the Whiting Lane Elementary School, West Hartford, Conn., and in the Brookline Motor Hotel, Brookline, Mass. At Whiting Lane, some of the unusual uses for porcelain enamel included a curved roof for a kindergarten playroom, porcelain enamel coping and such others as covers for diamond-shaped steel trusses in the dining room, both plain and acoustical panels in the auditorium, and as decorative elements in the lighting fixtures throughout the entire building.

At the Brookline Motor Hotel, an even more striking example, for what is said to be the first time in architectural history, a Class A city building code was changed to allow the erection of a porcelain enamel curtain wall structure.

New

Vitro Chalkboard Colors



Especially developed by Vitro for application on enameling steel, Vitro chalkboard colors are unequalled in appearance, wear resistance and performance (both during and after application). Extensive tests—conducted by an independent laboratory—prove these new colors give a superior writing surface that lasts longer without glossing. Actually, they retain their matte finish indefinitely.

From a production standpoint, Vitro chalkboard colors can be economically fired at low temperatures with no fear of metal warpage. They provide greater coverage per pound and assure easier gloss control. Want more information or a demonstration? Write us today—there's no obligation.

Blacks

Yellows

Whites

Greens

Also available in pastel shades to take water soluble wax crayons.



VITRO MANUFACTURING COMPANY • 60 GREENWAY DRIVE, PITTSBURGH 4, PA.

A DIVISION OF VITRO CORPORATION OF AMERICA

Sales Offices In Principal Cities

Answers to your questions about the supply of Foote Lithium Chemicals...

Q

Is industry getting Foote lithium compounds today?

A

The simple answer is "Yes"—to the tune of several times the quantity supplied industry in 1951. (And 1951 was a record year to that time.) We realize that this is not nearly enough to meet the greatly increased industrial demand that has steadily grown since 1950.

Q

Can I plan on using large quantities of Foote lithium in the foreseeable future?

A

Again the answer definitely is "Yes." Foote production is being increased to the point that early in 1955 Foote will be delivering lithium compounds to meet scheduled industrial demands.

Q

What about the rumors that all lithium is going to be set aside for a specific purpose?

A

Obviously, Foote Mineral Company would not have answered "Yes" to the first two questions above if the rumors were true.

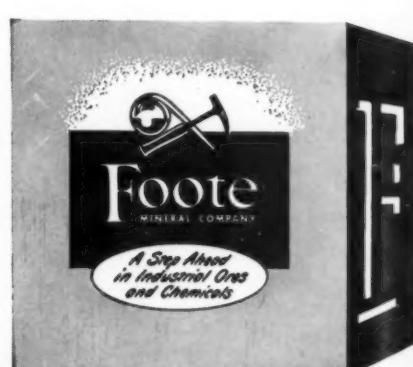


*Kings Mountain, N.C. . . .
where Foote is mining
the largest known
deposits of spodumene.*



*Sunbright, Va. . . .
the world's largest
lithium chemical plant.*

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FOOTE MINERAL COMPANY

412 Eighteen West Chelten Building, Philadelphia 44, Pa.

RESEARCH LABORATORIES: Berwyn, Pa. PLANTS: Exton, Pa.; Kings Mountain, N.C.; Sunbright, Va.

Production of colors in titania opacified frits

Part II — production tests and a list of do's and don'ts

by *Floyd J. Williams* • SERVICE ENGINEER, PEMCO CORPORATION, BALTIMORE, MD.

THE first production mill should be large enough to spray several pieces if necessary. Fifty to a hundred pounds frit charge will be sufficient. In loading the mill, make sure the mill additions are loaded correctly and the oxides are weighed accurately. How accurate will depend on your scales and on the relative amount of each oxide which should be used to develop the match. Naturally, a very small amount of oxide should be weighed more accurately than a larger amount. Check the enamel fineness and stop the mill approximately 2% coarser than the fineness specified. This will permit you to add corrections to your mill, if necessary, without grinding the enamel excessively fine.

Use scrap panels to check your first color matches. This will reduce your expenditure of materials and will give you a very good simulation of production conditions. Small test panels can be used for preliminary color checks, but the final match must be fired on a production piece.

Corrections can be made by mixing oxides in the milled enamel. However, it is best to check the corrections with a small amount of enamel slip before adding the correction to your production mill. A convenient method of checking the necessary correction is based on a 1000 gram frit charge. On the basis of 1000 grams of frit, one ounce per 100 pounds of frit is equivalent to .625 grams. This 1000 gram frit charge plus mill additions, oxides, and water is approximately

1500 grams of milled enamel slip. On this basis, draw a quart of enamel from your production mill and weigh out 1500 grams of enamel slip. For each ounce per hundred pounds frit, weigh out .625 grams of oxide and add it to the 1500 grams of enamel slip. Mix the oxides in by jar milling at least 15 minutes or by mixing in a Waring blender or Hamilton Beach mixer for at least 5 minutes. This should give you a thorough mixing of the oxides with the milled enamel. Fire a test plate of this corrected enamel to determine whether you have a match. If necessary, repeat the procedure until you have a good match for your standard color.

Then weigh out the oxide corrections you have determined for the production mill. Mix the oxide with enough water to completely wet the oxide and make it fluid. Draw some enamel slip from the production mill and mix with the oxide and water. Then remove the head and pour your correction into the mill. *By first mixing your oxides with water, you can insure a faster and more thorough mixing in your production mill.* Mill the enamel down to the fineness specified. Adjust the specific gravity and set to your particular practice and fire a production piece. A second mill may be necessary to develop an acceptable color match.

This procedure for correcting color mills is not the only one in use. Other methods may be just as convenient and acceptable. The important thing is that the mill is corrected with a

minimum of work and materials. This method has been used and has proven satisfactory.

The pilot run

After a color match has been accepted, larger size millings should be used to provide a pilot run. During this run, a normal control procedure should be followed. The enamel color should be checked by firing a test plate in the lab furnace. If necessary, correction should be made to the mill based on the procedure described above. When an acceptable color match is obtained, the enamel should be set up to the proper specific gravity and set required by the sprayers.

The sprayers may or may not be familiar with colored enamels. In any event, they should be aware that the enamel is not the same as the production white. Since the colored enamel will have more covering power when sprayed, the normal error is to spray the enamel too thin. If a semi-opaque frit is used, it is doubly important to make sure a normal application is used. In spraying colors, the proper specific gravity and set are very important because either a dry spray or an exceeding wet spray will change the appearance of the fired color. If the spray is too wet, the color will appear mottled on the fired piece. If the spray is too dry, a mottle or finish like a color separation will appear on the fired piece. Either of these appearances will be sufficient reason for rejection. Therefore, it is imperative that the proper attention be given to

the enamel set and spray techniques.

Clean spray booths and conveyors a must

The spray booth must be thoroughly clean for each color run. This cleaning will include the hangers and chain. Very minor amounts of white or another color will be sufficient to contaminate the color being sprayed. If more than one color is to be run during a shift, the spray booth must be thoroughly cleaned between each color run. The importance of cleanliness can not be over-emphasized.

Reoperations need not be given a full second coat. However, the enamel must be wet out on any reoperation. A dust coat on reops will produce the same effect as dry spray on first coat. If second and subsequent coats for reoperation are sprayed on evenly and wet, fired color of reoperations will not be significantly different from first coat colors.

Where first coat and reoperation are run on separate lines, the application weight on the reoperations may be partially controlled by adjusting the specific gravity downward slightly. This will allow the coating of enamel to be wet out with a thinner weight application. However, this ad-

justment of specific gravity may not be convenient where first coat and reoperations are run together in the same booth, since it would involve essentially two enamel systems for the same color. Therefore, if the same enamel is to be used for first coat and reoperations, care should be observed in spraying the reoperations.

It is important that firing time and temperature, and heat distribution within the furnace be controlled as closely as possible. While the colors are relatively stable, they certainly can not be mistreated. Some frits and some colors will be more sensitive to fire than others.

Make sure the furnace is clean and free from dust and scale. With the additional care taken with the color in the mill room and in spraying, there is no reason for relaxing when the pieces are hung on the furnace chain.

Pilot runs are important

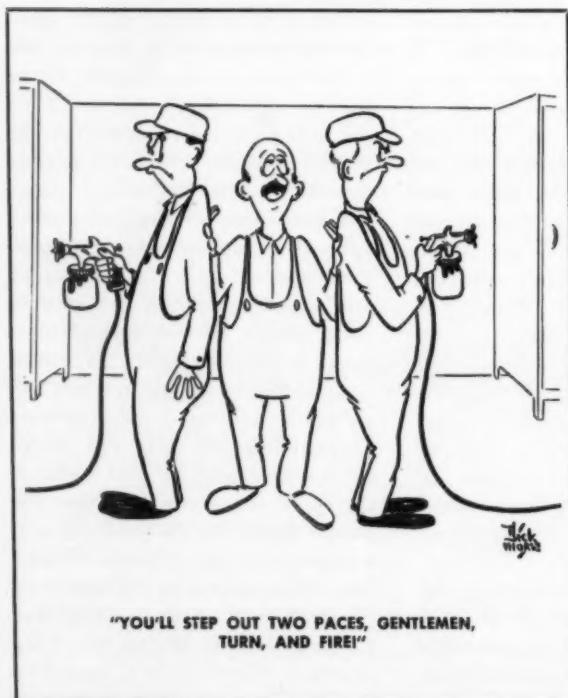
The original matches should be fired with a normal furnace load if possible. This will provide a true picture of the heat treatment given the color. If the furnace temperature and chain speed must be changed from normal production to fire the

color, the matches will necessarily be fired through an empty furnace. If this is the case, it should be recognized that the color developed may or may not be representative of normal production firing. The pilot run will provide an opportunity to select the proper firing conditions and also to establish a good production match.

In some plants, production conditions are more closely approximated in firing a color match by hanging scrap pieces ahead and behind the test piece. This will help to establish a more representative firing, although it may not reproduce full load conditions in the furnace.

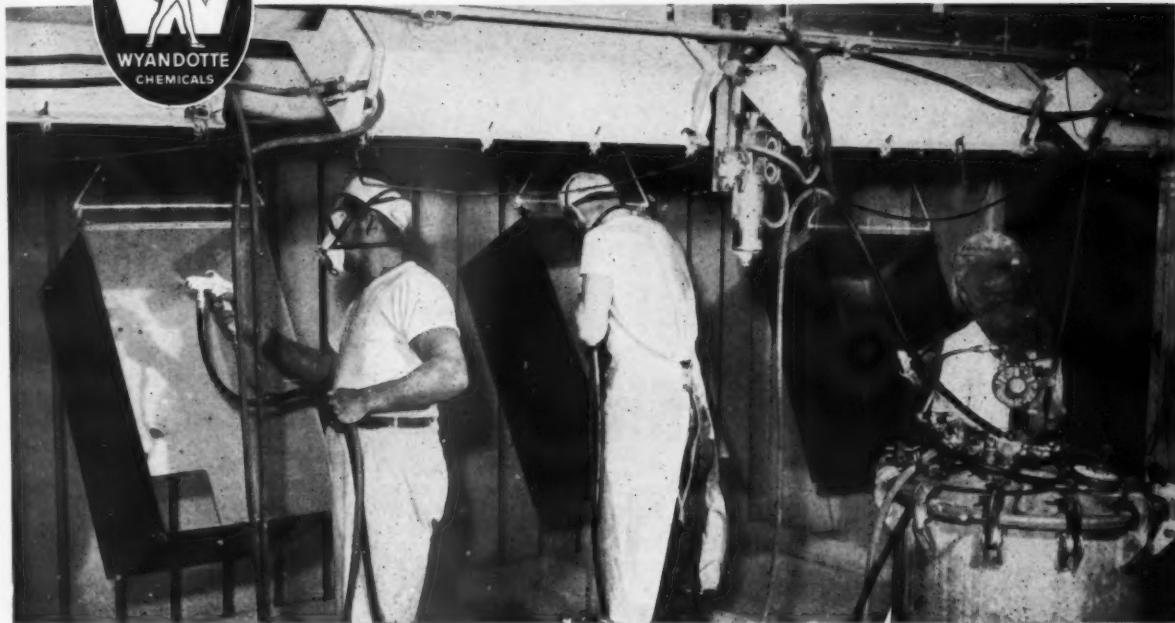
With sanitary ware and some appliance parts, the pieces must be hung in single file on the furnace chain. However, with flat panels and many small pieces, the method of hanging can be varied to minimize color variation. In many cases a single file of pieces through the furnace will be satisfactory. If the color should tend to vary, the pieces can be hung side by side. Each piece acts as a baffle for the other, and a more uniform color can sometimes be developed.

If the proper care and control is exercised in the development and *to Page 116 →*





Specialists in Metal-Cleaning Products



Wyandotte products reduce rejects—speed operations in porcelain enamel departments.

Photo Courtesy The DeVilbiss Co.

ENAMELERS...These Wyandotte products will help you improve quality...cut costs!

Wyandotte INDUSTRIAL No. 6—a prepared neutralizer with lower "use-cost" than basic alkali combinations. Its special formulation improves draining and drying, eliminates acid "back-drain" through complete seam and spot-weld penetration—no floating residues to adhere to basket and ware.

Wyandotte R-2—for extreme rusting problems after neutralizing. Can

be added to Industrial No. 6 to insure long storage of ware without rusting.

Wyandotte W.L.G.* is outstanding for heavy-duty pickle room cleaning. It has high detergency, long solution life, no disagreeable odors; is dust-free and removes even the toughest soil deposits.

Wyandotte MK, additive for soak

cleaner solutions, speeds cleaning action, shortens soak time, extends solution life.

For technical data on these or other Wyandotte cleaners, rust removers, paint strippers and spray booth products—call your Wyandotte representative, or mail coupon today! *Wyandotte Chemicals Corporation, Wyandotte, Michigan. Also Los Nietos, Calif.* *REG. U.S. PAT. OFF.



Helpful service representatives in 138 cities
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Largest manufacturers of specialized cleaning
products for business and industry

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Wyandotte Chemicals Corporation
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LOY WHERE THERE'S FAHRALLOY

BURNING TOOLS

No. 1 Choice of the
Porcelain Enamel Industry



There's always good reason why one product forges ahead to leadership in its field. Product performance, more than any other one factor, is largely responsible for this success. It is product performance which has made Fahr alloy burning tools the No. 1 choice of the porcelain enamel industry . . . product performance for over 20 years. When Fahr alloy alloys chrome, nickel and other metals to cast burning tools the specific service conditions which the castings must meet are given full and careful consideration. Then the metallurgically correct composition is determined to assure longest possible life under those tough service conditions at the high temperatures involved. With such exacting standards, is it any wonder why porcelain enamelers just naturally turn to the leader . . . to Fahr alloy for the answer to their burning tool problems? You'll find your answers at Fahr alloy, too.

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DETROIT Area Representative

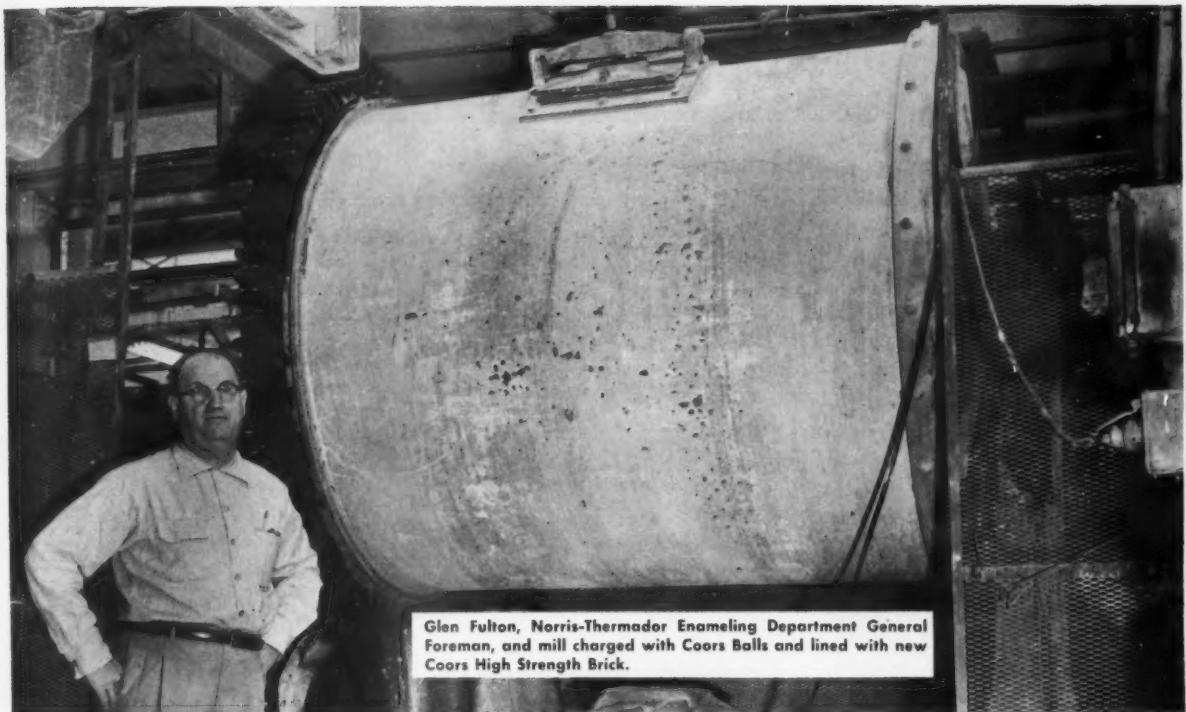


THE FAHRALLOY CO.

150th & Lexington Ave. — Harvey, Illinois

In Canada — Fahr alloy Canada, Ltd., Orillia, Ontario

WHERE THERE'S HEAT THERE'S FAHRALLOY WHERE THERE'S HEAT THERE'S



Coors High Density Balls and Liners increase production at Norris Thermador Corp.

"Here at Norris-Thermador Corporation, we have reduced our grinding time, and simultaneously have increased our mill loads up to 50%, by charging our mills with Coors High Density Grinding Balls.

"Also, we formerly added 12 pounds of conventional balls with each charge of frit. No Coors Balls had to be added for a period of time in which 245,000 pounds of frit was ground.

"We are well pleased with the increase in production we have been able to accomplish

due to our change to Coors High Density Balls."—Glen Fulton, General Foreman, Norris-Thermador Corporation.

(Norris-Thermador Corporation was the first porcelain enamel plant on the Pacific Coast to use Coors High Density Grinding Balls—and is the first porcelain enamel plant in the U.S. to use Coors new High Density Mill Lining Brick with integral lifter bars.)

Write, wire, or phone your nearest Coors representative, today, for facts and prices!


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 GOLDEN
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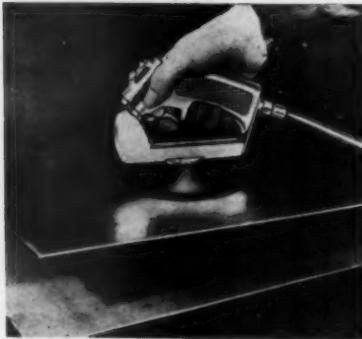
National sales representative, L.Z.P. Industries Ceramico, 2300 W. 7th Ave., Denver 4, Colo. • Sales agent, roofing industry west of the Rockies, Chicago Vitreous Enamel Product Co., 1427 S. 50th Ct., Cicero 59, Ill. • California sales representative, Melvin L. Jones Co., 3028 Alhambra Ave., Los Angeles 32, Calif.

New

Supplies and Equipment

I-10. Sheet lifter has constant vacuum from compressed air

New As long as the trigger in the pistol grip type handle of the Pres-Vac lifter is held down, the suction cup will pull 11 lbs. psi,



making the work of lifting sheet steel easier. This results in multiple savings and increased safety in production line operations, and in warehouses.

I-11. Bed rail adapters for press brakes

New These new adapters are used with press brake bed rails for fast, accurate mounting to layout pattern of independent, self-



contained hole punching and notching units.

Spring-check steel balls provide tension to securely hold adapter in bed rail. Two pilot pin holes are located on one side of these adapters for straight-line hole punching, and a slot on the other side for front to back mounting for staggered hole punching pattern. A built-in scale on the bed rail and the center line of these adapters facilitate left to right locating and mounting of the units.

The use of hole punching and

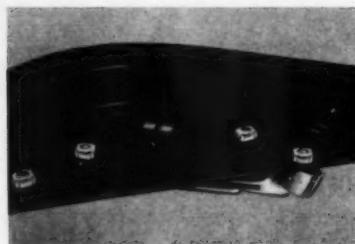
More Information

For more information on new supplies, equipment and literature reviewed here, fill out the order form, or write to us on your company stationery.

notching units with the bed rail adapters are said to reduce tooling to a simple, quick assembly operation.

I-12. Once installed, this T-shape nut cannot be rotated

New This T-shape nut, preassembled into a spring steel retaining cage, can be easily slipped into a panel hole and anchor-locked



in position. Once installed, it is impossible to rotate the nut or drive it out of its spring steel enclosure.

In assembly operations, the nut is merely placed into a panel hole by hand and pressed to locked, screw-receiving position with a simple hand tool. It is designed to withstand excessive amounts of torque.

I-13 Low amperage motor protector for home appliances

New Designed primarily as a protective device for motors, this new permanent type circuit protective device can also be used on

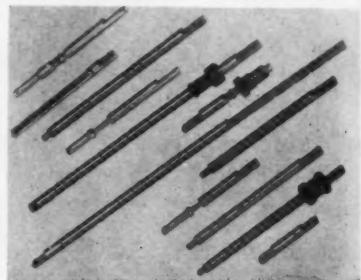


home appliances, electronic equipment, etc. It will fit branch circuits

of 4, 4½, 5, 5½, 6 and 7½ ampere ratings. It is designed to protect equipment rather than wiring.

I-14. Special-purpose shafts for appliance dials and knobs

New For standard use on home appliances and electronic equipment, and wherever dials and knobs are needed, a complete range



of shafts is now mass-produced at low cost. They are now available in an almost limitless design range, including varied diameters on a single shaft, snap-ring grooves, "D" or double "D" flats, knurling for pressed-on plastic or fiber bushings, and end-kurling for fingertip actuation. They can be custom-made.

I-15. Processing rigid plastic with metal stamping equipment

New Rapid forming of Geon rigid vinyl plastic can be done with conventional metal stamping equipment. As shown in photo, plastic sheeting is fed from reels un-



der a bank of strip heaters to raise its temperature to 260-275° F. Two sets of rubber rollers control the movement of the sheet. A clutch arrangement permits the sheet to be fed intermittently to the conventional stamping press. Cycle time is 10 seconds, and stock is cut off during the molding operation.

I-16. Liquid stripper removes Epon varnish in 15 minutes

New A heavy duty liquid stripper, called "Strypp-Away", will remove tough modern finishes like Epons and other chemically-resistant finishes in a short time. Tests have shown that the stripper can completely remove an Epon varnish in 15 min. heated to 200° F.

I-17. Convection batch-type ovens for small parts production

New A new line of heavy duty, convection, batch-type ovens are especially designed for small parts production and for pre-



cision laboratory testing. They are available either electric or gas-fired. They feature Inconel-sheathed heating elements.

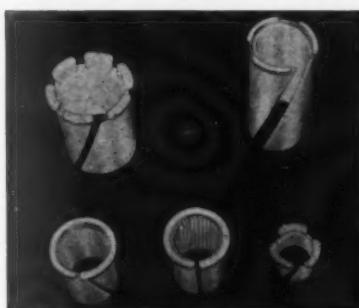
I-18. Leaded zinc oxide for paint

New A new type of leaded zinc oxide, said to be more efficient in paints than regular types, is composed of 82% zinc oxide and 18% monobasic lead sulfate. Experimental work shows that 4 lbs. of the new oxide may be used to replace 5 lbs. of regular 35% leaded zinc oxide while still retaining equal zinc oxide and equal effective lead content.

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I-19. Flanged Nyliner bearings

New These flange-type Nylon bearings, designed to eliminate lubrication and to increase bearing life, incorporate the compensation



gap principle which permits circumferential expansion and contraction of the Nylon material without appreciably affecting the bore diameter. They can be used for major appliances and automobiles, as well as other special applications where corrosion resistance, vibration damping, compactness, and abrasion resistance

can give added product performance.

I-21. Spray it on—peel it off

New The simplicity of the removal of white Vincote, a new vinyl protection covering for wall surfaces of paint spray booths, is



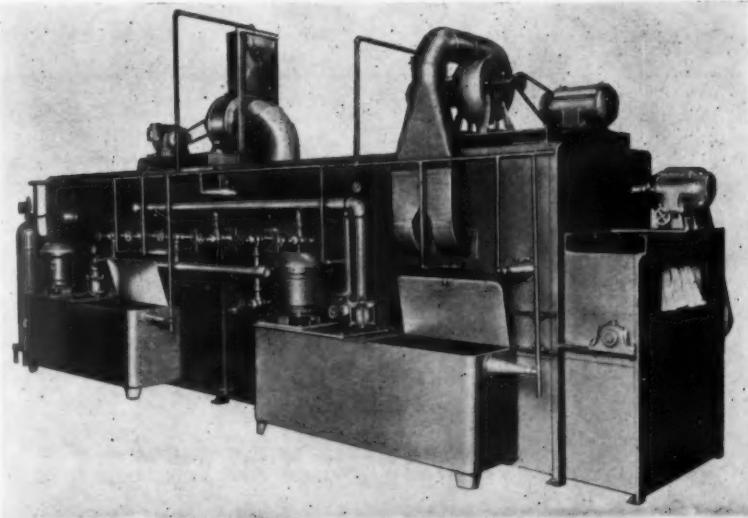
shown in this photo. Easily sprayed on, it is easily peeled off, and, along with it, all accumulated overspray.

I-20. Cleaning machine uses low-flash cleaning solvents

New This special metal cleaning machine uses low-flash petroleum-type cleaning solvents. It was first designed for a bearing manufacturer to remove grinding residue and shop dirt from precision ball bearing parts before assembly. The bearing parts pass through consecutive high-pressure fan-shaped curtains of solvent. Both emulsion and alkali cleaning solutions can be used

in this machine. Solvent filtration is accomplished by a screen tank having two independent screens, enabling one screen to be removed for cleaning without interrupting the cleaning operation.

An automatic fire extinguishing and fire control system is standard equipment when machine is designed for use with petroleum-type solvents.



New Industrial Literature

901. Sound movie on packaging loaned free

New An 11-minute sound movie, "Package for Profit", shows stapling machines operating in actual installations, and explains their operations. The camera takes the viewer into plants where retractable anvil stapling equipment is being used. The viewer is shown in factual case-history style how users of the equipment have substantially reduced packaging costs by saving time, increasing labor efficiency, conservation of floor space, and by reducing losses from damage during shipment.

902. Stampings from tooling to the finished product

New This brochure describes the facilities of a midwest company with three plants available for contract stamping — from start to finish.

Facilities include large presses, 15 to 75 kva spot welders, arc and acetylene welding equipment, hydrogen brazing, painting, metal polishing, tumbling, plating, machining.

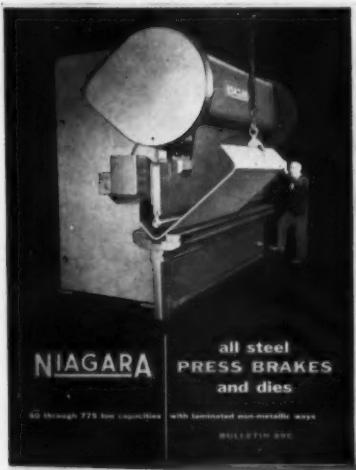
903. Guide to finishing and plating racks, fixtures and tips

New This free 24-page catalog provides a ready source of information on racking methods and tip constructions for finishing and plating. The book is planned to acquaint the reader with fundamental

tip, or work holder, forms and basic racking procedures. It is meant to constitute a background for suggesting the correct approach to any specific problem.

904. New press brakes bulletin

New Described and illustrated in this 32-page bulletin are key features of Niagara press brakes, such as double-end twin-drive, rigid



frame construction, box-type crowns, sealed oil baths for gearing, laminated non-metallic ways, and an exclusive electro-pneumatic clutch.

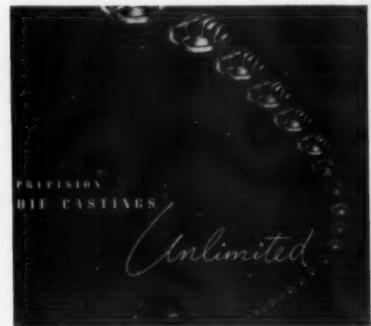
905. Wire mesh product catalog

New This catalog illustrates a wide variety of wire mesh products for appliances and indus-

trial applications. It describes wire mesh products made in various sizes, mesh and alloys.

906. "Die Castings . . . Unlimited"

New This new four-color, 24-page brochure contains over 75 pictures, drawings and charts which graphically explain die-casting



processes, including die-building, alloying, casting, trimming, machining, plating, finishing and inspection of aluminum, magnesium and zinc castings.

907. Self-sticking tape reference

New Indexed and sub-divided, this 174-page reference manual, covering self-sticking tapes, describes and illustrates the basic uses under which most tapes can be classified. Hundreds of uses for self-sticking tape are illustrated and classified according to industry.

908. Paint filtration literature

New This brochure covers filtration of industrial, appliance and automotive products for both producer and user. Applications and characteristics of filtration equipment are covered.

909. Literature on complete equipment for Safe Transit testing

New Information on a single source for complete equipment for testing under the National Safe Transit Program procedures is now available.

Equipment includes friction-free all-steel incline impact tester; a vibration test and rigid all-steel drop test unit.

FINISH
York Street at Park Avenue
Elmhurst, Illinois

Please forward to me at once information on the new supplies and equipment and new industrial literature as enumerated below:

No. _____ No. _____ No. _____ No. _____

No. _____ No. _____ No. _____ No. _____

Name _____ Title _____

Company _____

Company Address _____

City _____ Zone _____ State _____